A. B. C.
OF HOME
DECORATION



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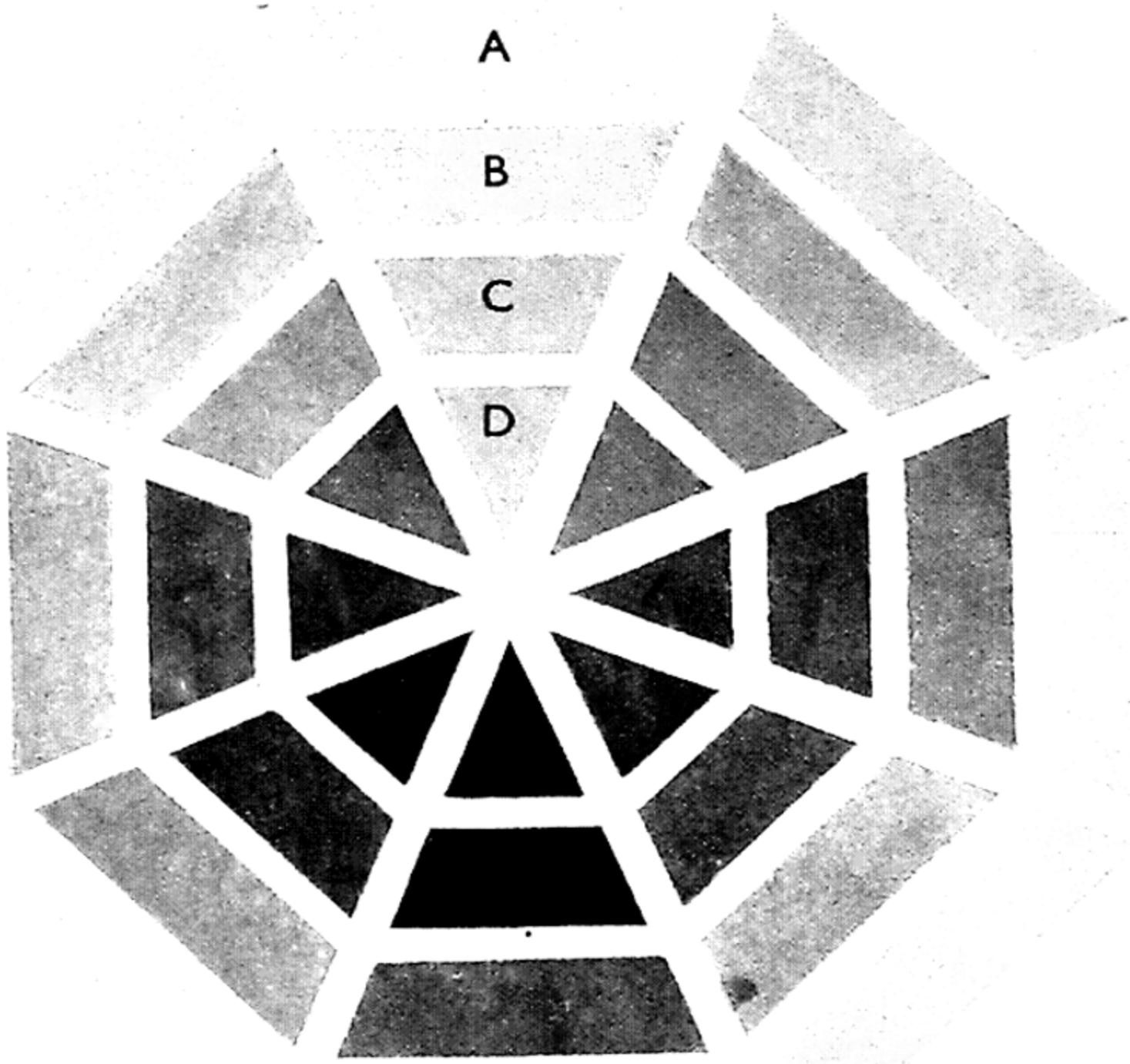


FIG. 95.—THE COLOUR CIRCLE, ILLUSTRATING

A. Pure tints
B. Pastel tints
C. Colours reduced with pale grey and
D. The natural tone order of pure colours.

Contrasting (complementary) hues are diametrically opposite.

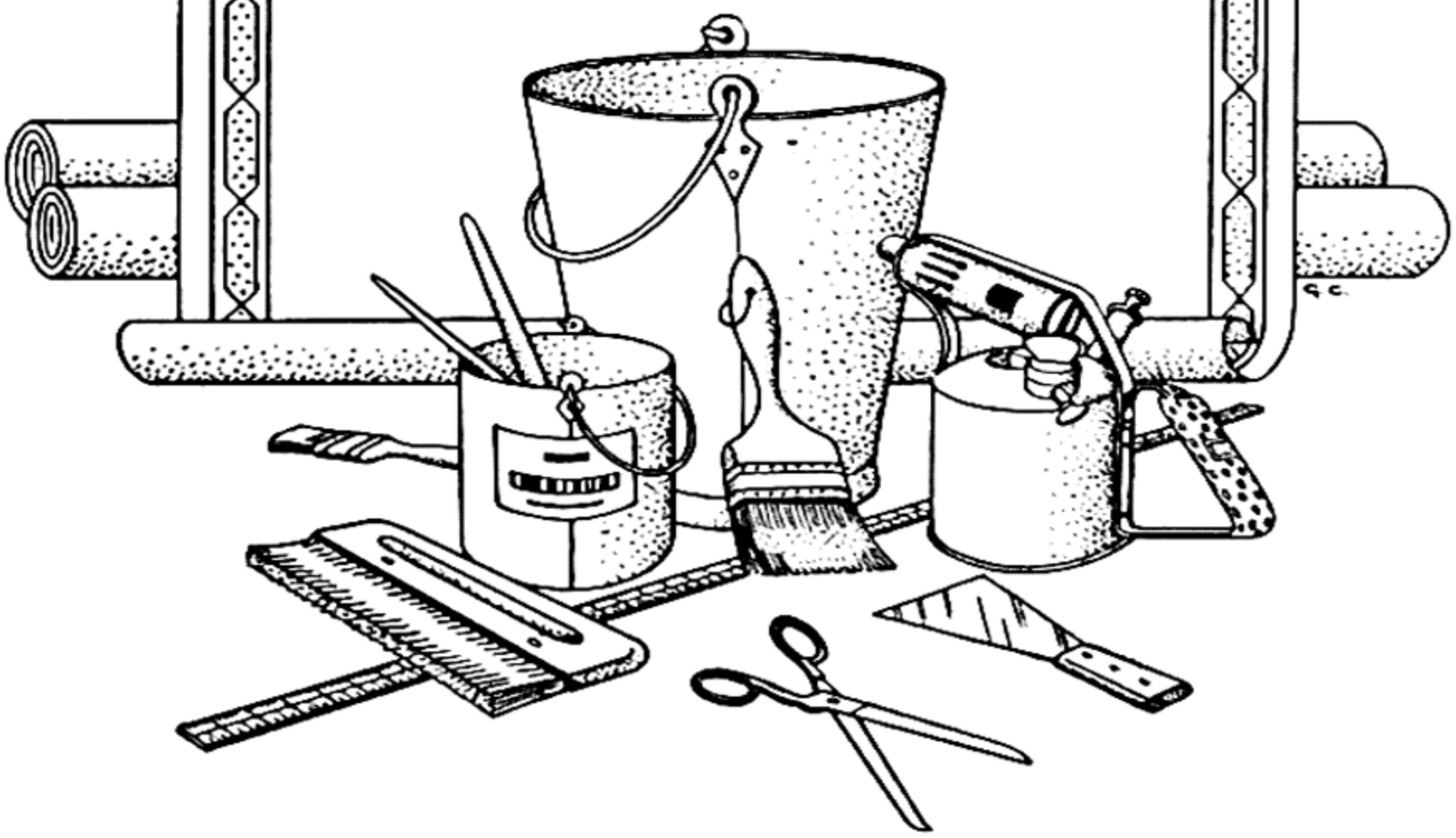
(*See p.* 264.)

A.B.C. OF HOME DECORATION

by

J.P. PARRY

F.I.B.O., M.R.S.T.



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INTRODUCTION

In writing the "A.B.C. of Home Decoration" I have endeavoured to develop the subject in a straightforward, rational manner, with the object of providing a simplified guide-book comprehensible by the layman and others interested. The various processes and methods employed in preparing, painting, and decorating the inside and outside of a house, are arranged in quick reference form. The presentation is somewhat novel but none the less authoritative and complete.

I have included sections dealing with the use of ladders, safety measures to be observed, the painting of work not easily accessible, the mixing and matching of standard tints, guidance concerning the amount of material required, organisation of the job, and many other details not published hitherto.

JOHN P. PARRY.

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PART I

OUTSIDE WORK

CHAPTER I

OUTSIDE PAINTING

How, when, and where to commence.—Correct order of procedure.—Selection and use of ladders, equipment, tools, and materials.—Safety measures.

In painting the outside of a house our first thoughts will naturally be concerned with the preservation and weather-proofing of all wood and ironwork, and perhaps with the structure itself. Decoration is really a matter of secondary importance, but that does not imply that efficiency and drab colourings are necessary evils; on the contrary, we have an ever-widening range of materials and colours from which to make our selection, and, given the right combination of materials, methods, and conditions, the twin objects of preservation and decoration will be successfully achieved.

The Best Time for Exterior Painting

As a sound job is secured by doing the right thing at the right time and in the proper manner, we must consider how, when, and where to commence operations.

There is a great temptation to follow the example of Nature: to brighten up our surroundings during the days of early spring; and while this may fit in with the annual spring cleaning of the house and garden, it is unwise to paint woodwork which is still damp as a result of winter rain.

If the work is postponed until late summer, we shall find the work in an ideal condition for painting: open joints, due to the general shrinking of woodwork, can be treated more easily and efficiently; the various

surfaces—particularly the insides of gutters—are perfectly dry, and the heat of the sun is unlikely to cause blistering.

Correct Order of Procedure

As the work may spread over several weeks, it is a good idea to tackle those parts involving ladder work and to complete such jobs as skylights, gutters, and barge-boards in advance of the remaining work: the reasons being: (*a*) insides of gutters are frequently waterlogged in places, or partly choked with accumulated dust, leaves, etc., and must be cleaned out and dried before painting; (*b*) rust and scale must be scraped from iron gutters and supporting brackets, and will obviously settle upon window-ledges below.

There is no reason why this should not be done during the best weather—midsummer; this to be followed by the preparation of window-frames, the replacement of broken panes, repairs to cement-work, the pointing of defective brickwork, and any other job which is liable to create dirt or dust. By following this procedure the work continues in an orderly manner, and no finished work is likely to be damaged or splashed with paint.

Although the doors are finished last, their preparation should be attended to and the first coat of paint applied before the bottom window-frames are completed; dust is thereby prevented from settling upon finished work.

In cases where the main structure is cemented and requires waterproofing or painting, the order of procedure should be planned so that all the work is prepared and given one coat of paint; the gutters are finished first, then the main structure, and finally the window-frames and fall-pipes. The ladder head must be padded with clean rag to avoid scratching the cement-work

during the painting of fall-pipes; doors, as usual, will be completed afterwards.

Selection and Use of Ladders, etc.

One of the main difficulties associated with outside painting is that of climbing to a point within easy reach of the job in hand. The old-fashioned type of ladder with its unalterable length is not very helpful, except perhaps for roof work; it is usually too long for one part and too short for other sections of the work, and has for some years been regarded by painters as obsolete.

The Rearing or Raising of Long Ladders

This is often a source of anxiety to the beginner, and to take down the ladder is usually more difficult: there is only one correct procedure, and if this is carefully followed it is not difficult for two men to rear any ladder up to thirty rungs (approx. 24 feet) in length.

The first job is to find a firm and level place for the ladder foot: a spot about 6 feet away from the side of the house will do nicely. Observe and avoid any obstructions, such as telephone wires, cables, clothes-lines, etc., likely to check one's progress, and, above all, make sure that the ladder head will come to rest upon a solid wall or gutter, and not upon a window-pane. If the ground slopes, the person raising the ladder will find the task much easier if he is able to walk down the slope: the work is doubly hard when walking uphill.

Now for the actual operation. The man who foots the ladder has the most responsible job. He must stand with both feet upon the bottom rung or stave; the feet to be some 8 or 9 inches apart, so as to distribute the weight evenly. He must then grip the third rung with both hands and assume a crouching (Fig. 1) position, trying as it were to sit upon his heels.



Fig. 1

REARING A LADDER

By adopting this seemingly awkward position—and what is even more important—"*staying there until the ladder is reared*"—he can use his weight to the best advantage and ease the task of raising the ladder. There is little risk in the actual lifting operation, providing that the ladder foot is firmly held down, but it is wise to avoid those helpers who claim to know how to "foot" a ladder, and then adopt a standing position just at a time when the greatest strain falls upon the one doing the work. At this critical moment the maximum weight is required as near to the base of the ladder as possible, and if each man attends to his own part of the job and ignores any slight movement of the ladder foot, there should be no hitch.

Where the ladder is unduly long or heavy it is advisable to post an extra man at one of the upper bedroom windows. From this position he can, with the aid of a good rope, render some very real service in supplementing the efforts of the two men below. To be really effective, the rope must be secured to the centre of one of the upper rungs and at a height which falls slightly below the window when the ladder is erected (Fig. 2).

Lowering a Ladder

A ladder is lowered by following the same detailed instructions, in reverse. The person taking the more strenuous part should grip the ladder sides (not the staves) and walk slowly backwards taking short steps until the weight becomes more easily manageable.

An alternative method which can be managed without assistance is accomplished by drawing the ladder foot, a little at a time, away from the house wall, and thereby allowing the ladder head to slide down the side of the house. The ladder must be held firmly, keeping the foot in contact with the ground until the ladder is suf-

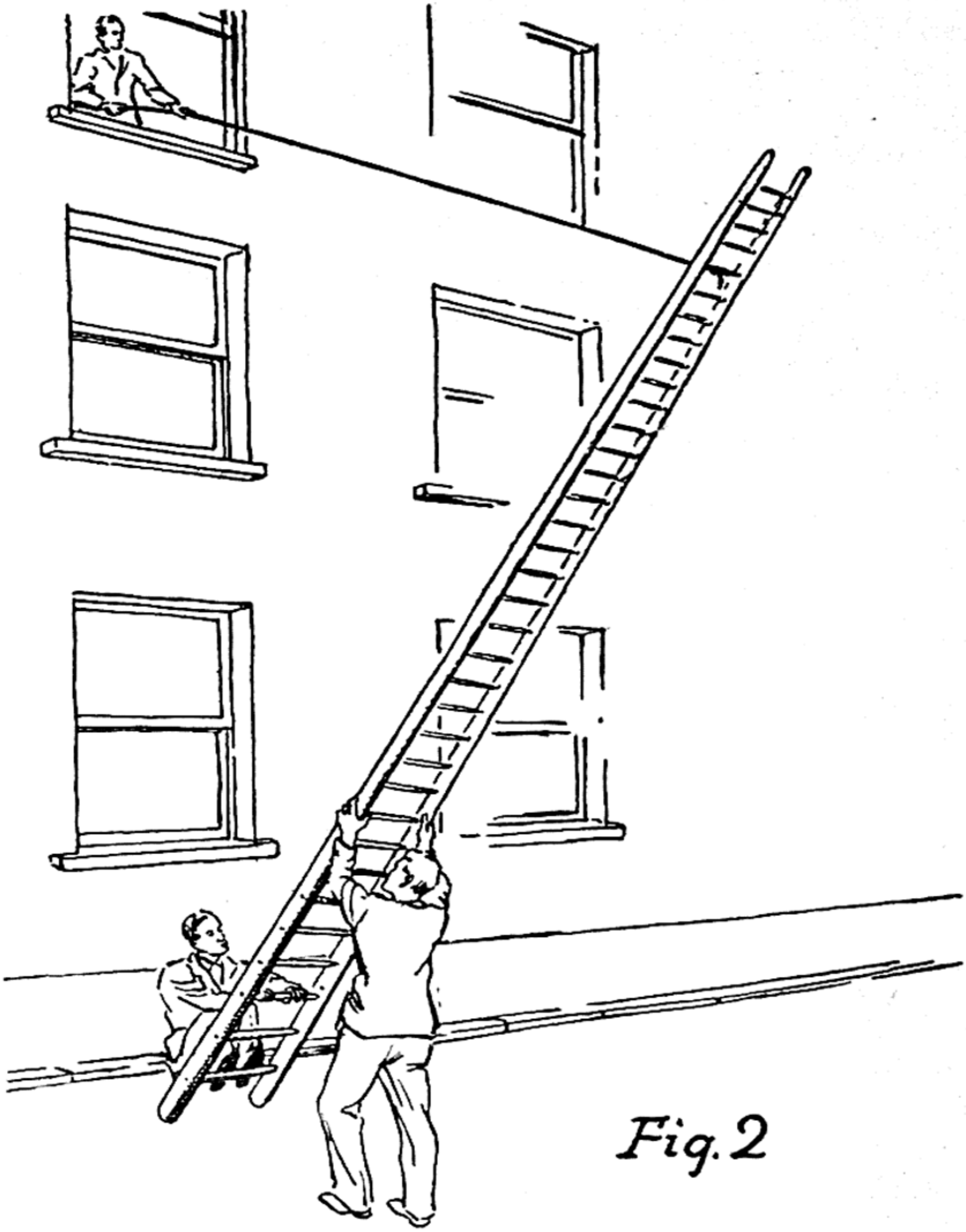


Fig. 2

REARING A LONG LADDER

ficiently horizontal to be grasped and balanced centrally. Obviously, this procedure cannot be adopted if the house walls are painted, but upon bare brick or stonework it offers an easy way out.

The Splicing of Ladders

It is useful to know how to lash two ladders together in the manner adopted by builders, as by this means we can increase the length of a ladder by anything up to 6 feet. For this job we require two strong ropes (stout sash cord will do), each about 20 feet in length. Place the two ladders together—*i.e.*, one behind the other—keeping the stronger or heavier one in front because it will carry the weight.

The strongest rope is now folded in half and fixed to the bottom rung of the ladder nearest the wall, the loose ends are brought up between the ladders to the height of extension required, and then drawn forwards over one of the rungs of the ladder in front (Fig. 3). An assistant will now be required to stand beneath the ladders and lift the nearest one perpendicularly to the necessary height. The rope is passed two or three times around the rungs, and then the ends are lashed tightly and secured around the ladder sides immediately below.

The job is completed by a second lashing attached to secure the top stave of the front ladder to the adjoining stave behind. Complete by lashing and securing the rungs and sides as before. Tight lashing is essential throughout. After use, the procedure must be reversed when unsplicing.

Ladders can be spliced when lying flat upon the ground. This permits an extension greater than is possible by the first method: the only limitation being that there must be at least 5 feet of an overlap to allow for firm lashing (Fig. 4). This enables two 15-feet

Fig. 3

SPLICING TWO LADDERS



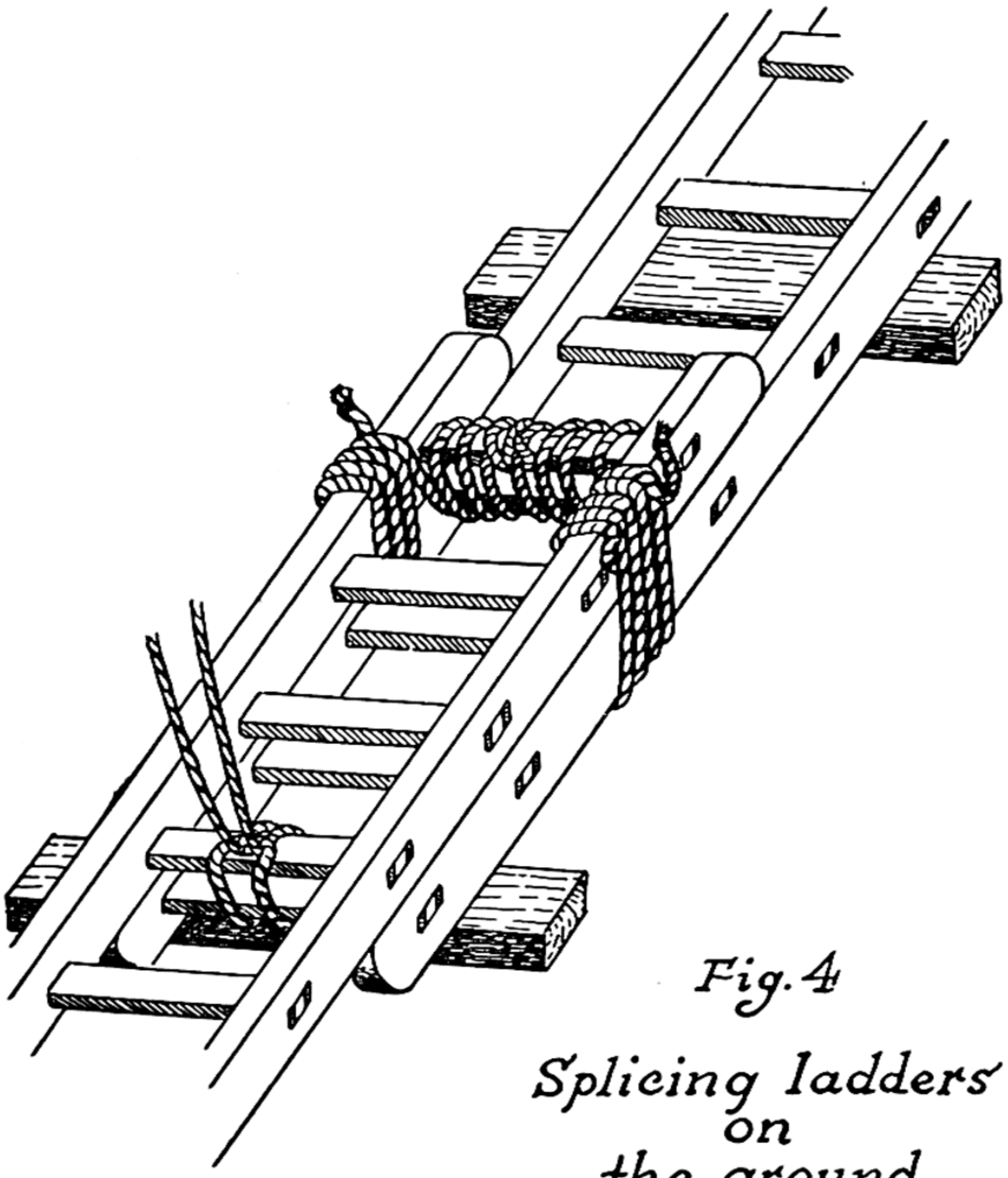


Fig. 4

Splicing ladders on the ground

ladders to be extended to 25 feet, as against 21 feet by the first method. The only difficulty is that of rearing the ladder—splicing adds considerably to the weight.

Extension Ladders

These are available in two varieties: (*a*) a simple "push-up" type, and (*b*) the more useful "rope-and-pulley" type. Each can be obtained as a two- or three-section ladder, the latter offering a wider range of possible uses. The best and most easily managed is a simple two-section ladder of a telescopic type, with rope for hoisting. In such types the sections are erected one at a time and assembled in an upright position, thus eliminating all strenuous work, and enabling the job to be performed without assistance.

And now a word of warning. We know of a case where a man's wrist was broken as a result of a rope breaking or slipping during the hoisting operation: the victim had gripped a rung of the stationary section with his left hand and was hauling upon the rope with his right hand when the ladder slid down unexpectedly.

Accidents of this nature are extremely rare, because in the majority of cases the locking device is weighted in such a manner as to engage upon the next stave below IF the rope should break. Repeated coatings of paint are likely to interfere with the efficient working of these movable parts unless regular lubrication is observed.

The Selection of Ladders

There are certain desirable features which should be present in all types of ladders—including step-ladders: (*a*) the base should be broader and heavier than the top; (*b*) the ladder should be firm—*i.e.*, not possessing a tendency to swing sideways when in use (*Note.*—The slight resilience of a long ladder is a perfectly normal and desirable quality); (*c*) rungs should not be loose and capable of turning in their sockets; (*d*) an adequate number of the tie bolts—$\frac{1}{4}$-inch bolts placed beneath the

METHOD OF TESTING A LADDER

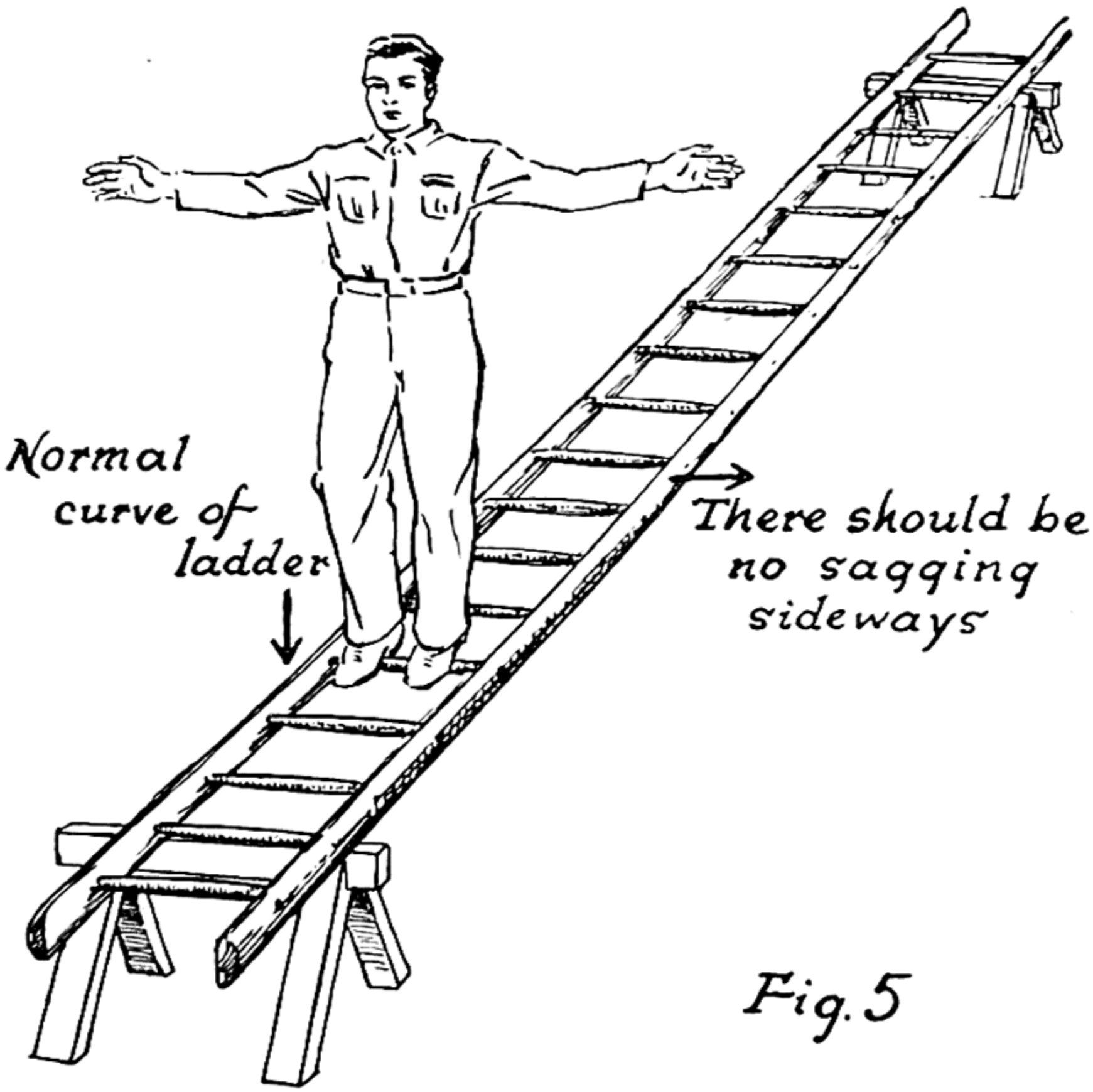


Fig. 5

staves at intervals of 6 to 8 feet—should be present; (*e*) the safest ladders are usually reinforced by stout galvanised wire, partly inlaid beneath the staves and sides.

New ladders should be examined before they are painted, and immediately rejected if large knots or other flaws are evident. Any ladder, if placed across two saw stocks, is of little use unless it is capable of bearing the combined weight of two men—say, twenty-four stone (Fig. 5). Other, and more obvious features concern items such as ropes, the hinges of step-ladders, etc.; all must be maintained in sound condition.

Safety Measures

As ladder work is our immediate concern, there are several points worthy of note.

(1) If working upon sloping ground it will be necessary to "pack" or wedge one of the ladder feet. This is best accomplished by the use of large wedges (Fig. 6), or alternatively by stout boards; but on no account must slate or other brittle substance be used.

(2) When working upon soft ground (including lawns) it is safer to rest the ladder foot upon a stout board: a suitable size would be approximately 3 feet by 8 inches by 1 inch. Apart from its use as a safety device, it prevents damage to the lawn surface (Fig. 7).

(3) A ladder must not be employed at a dangerous angle—*i.e.*, too perpendicular, or with too great a slope. An angle of about 75° to the ground is considered safe, but to increase the angle will require something or someone to prevent the foot from slipping (Fig. 8).

(4) Roof work and other awkward jobs will be dealt with in Chapter III, so it is only necessary at this stage to mention the appropriate building (scaffolding of)

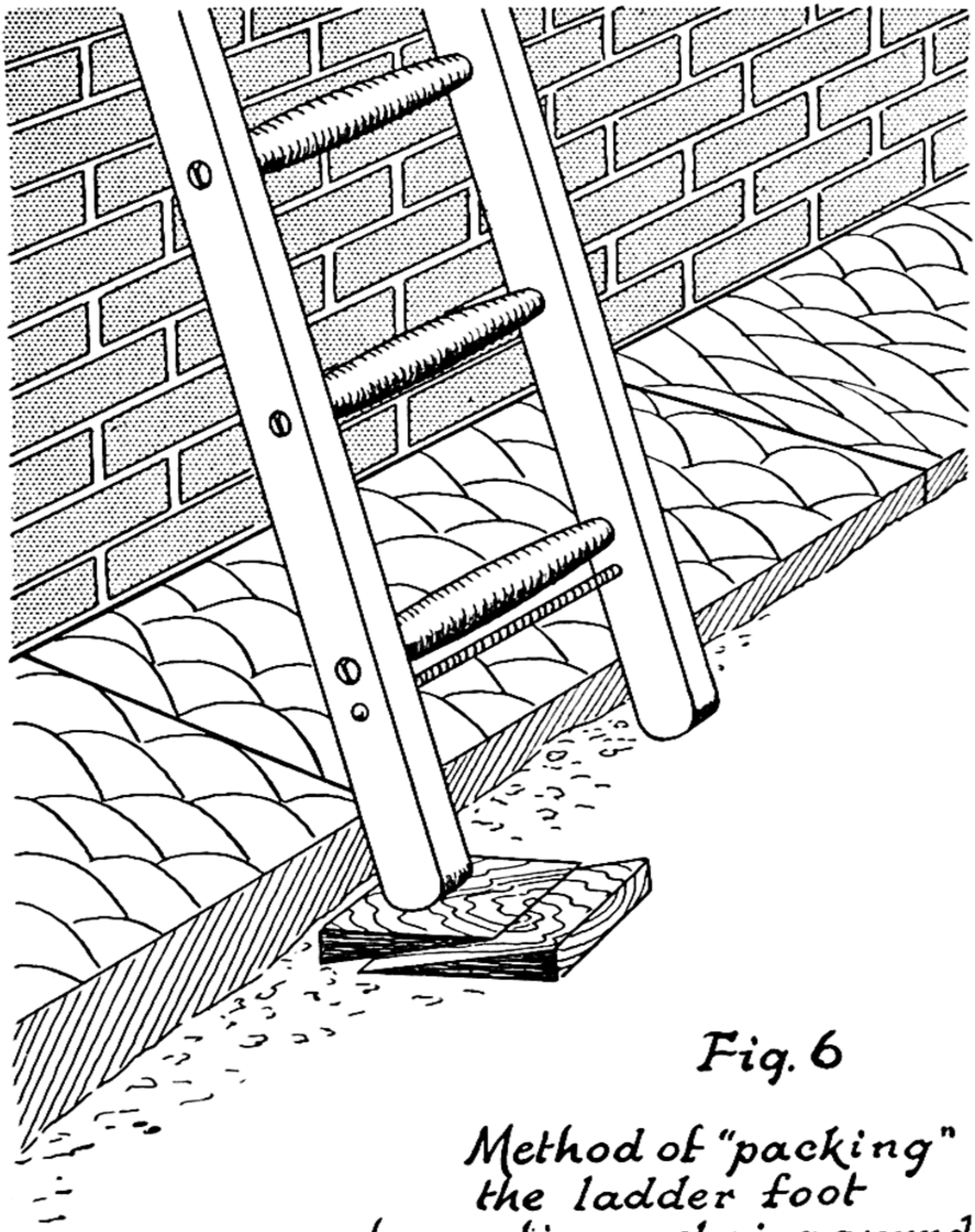
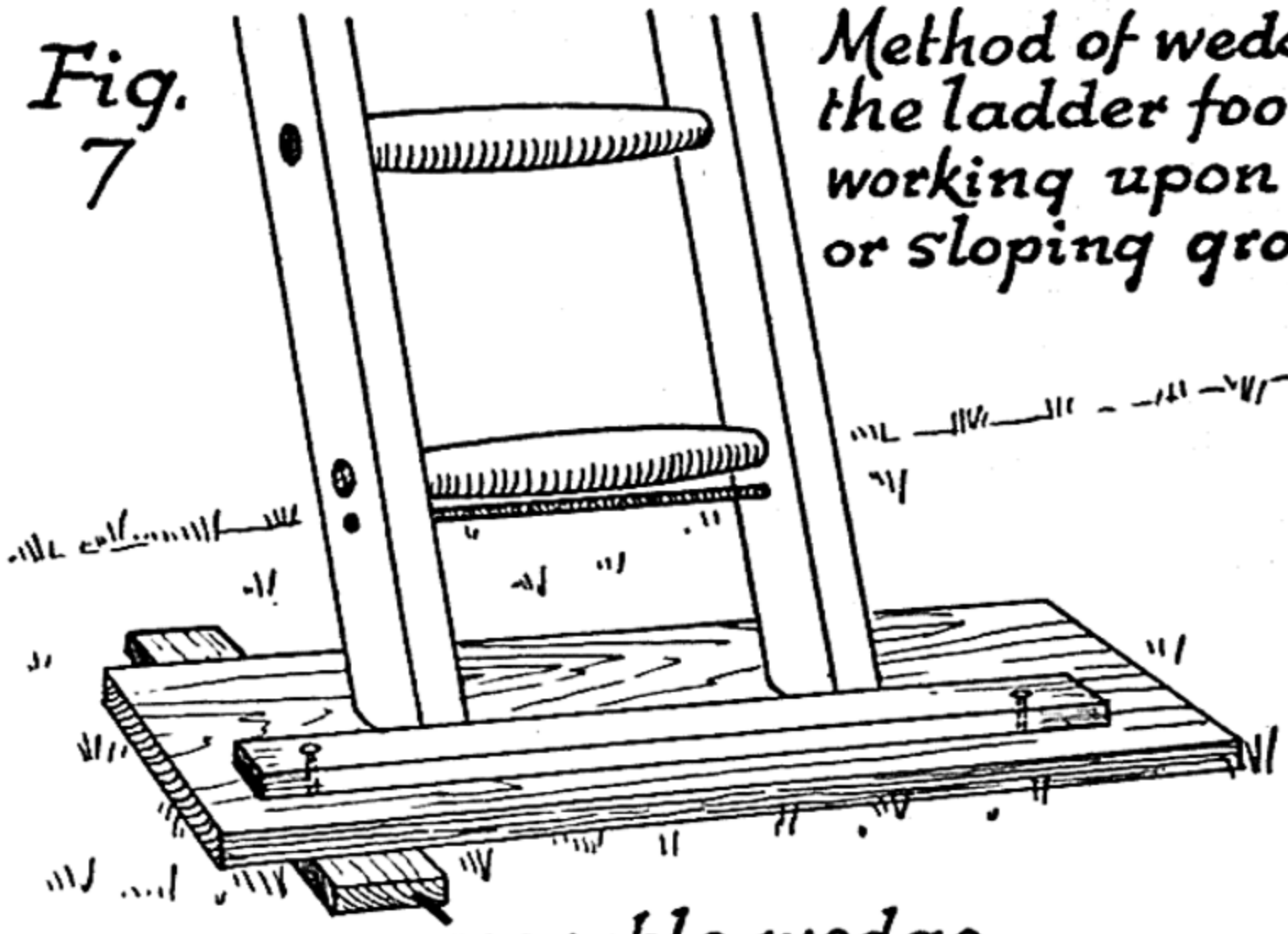


Fig. 6

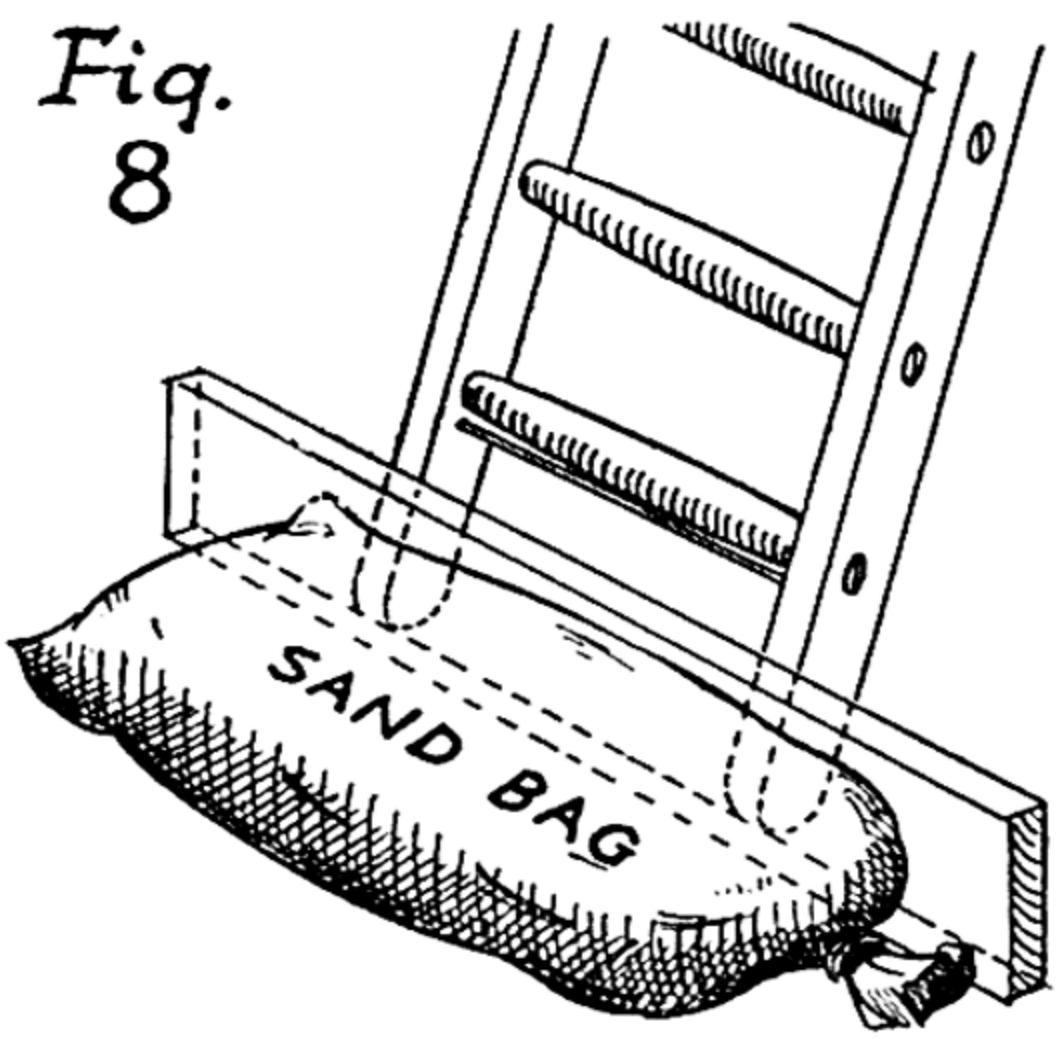
Method of "packing"
the ladder foot
when working on sloping ground

Fig. 7



Method of wedging the ladder foot when working upon soft or sloping ground.

Fig. 8



Simple device for holding the ladder foot securely.

regulation which states that a ladder must be lashed or otherwise secured and must project 3 feet above the level of the gutter, when roof work is in progress.

(5) A ladder should be kept perfectly upright and not tilted over to the left or right.

(6) When using an extension or spliced ladder it may be necessary to turn the ladder back to front in order to form a safe and natural step at the point of junction (Fig. 9).

(7) Do not allow the ladder head to rest upon wet paint; it is safer, when painting gutters, to keep the ladder immediately below, and not resting against the gutter edge.

(8) When ascending or descending it is better to hold the ladder sides rather than the rungs. A bucket or paint-can should be attached by a hook to one of the rungs, thus keeping the hands free for the combined task of painting and holding on to the ladder. This business of keeping a firm grip upon the ladder is important; it preserves confidence and a good sense of balance, both of which are essential to one's comfort.

(9) And, finally, a few hints concerning the preservation of balance. It is most unwise to grab wildly in an effort to prevent tools from falling, or one's hat from blowing away: such articles can be retrieved in a more leisurely and safer manner. Avoid reaching out too far: if a portion of the work is out of reach, the brush can be tied to a handy length of timber or attached to a "man-help" (Fig. 10).

Miscellaneous Articles of Scaffolding

There are three items which are likely to be of service when a job cannot be reached by more direct means.

Cat-Ladders or Duck-Boards are particularly useful when a section of any roof must be crossed. Although light

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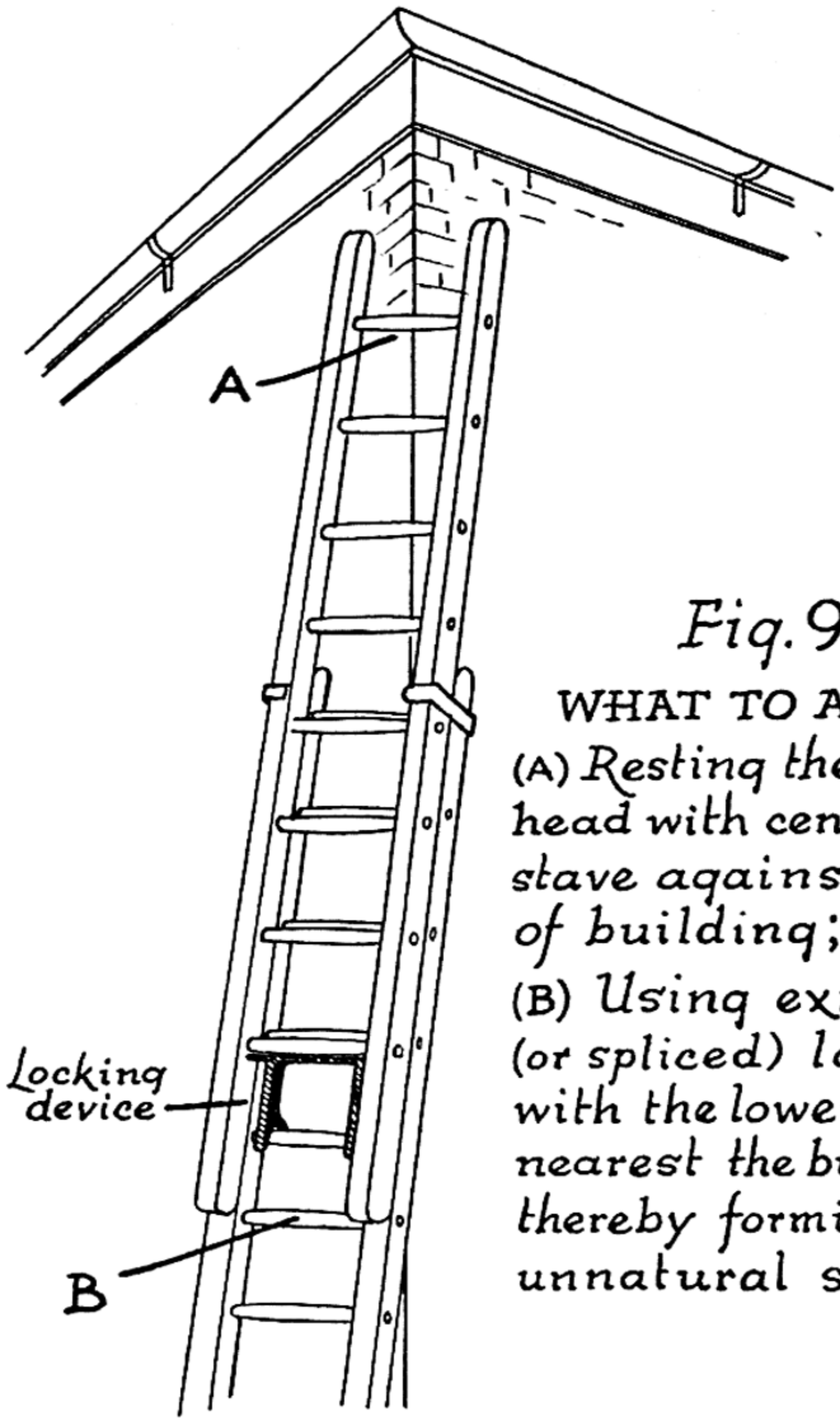


Fig. 9

WHAT TO AVOID

(A) *Resting the ladder head with centre of stave against angle of building;*

(B) *Using extension (or spliced) ladders with the lower section nearest the building, thereby forming an unnatural step.*

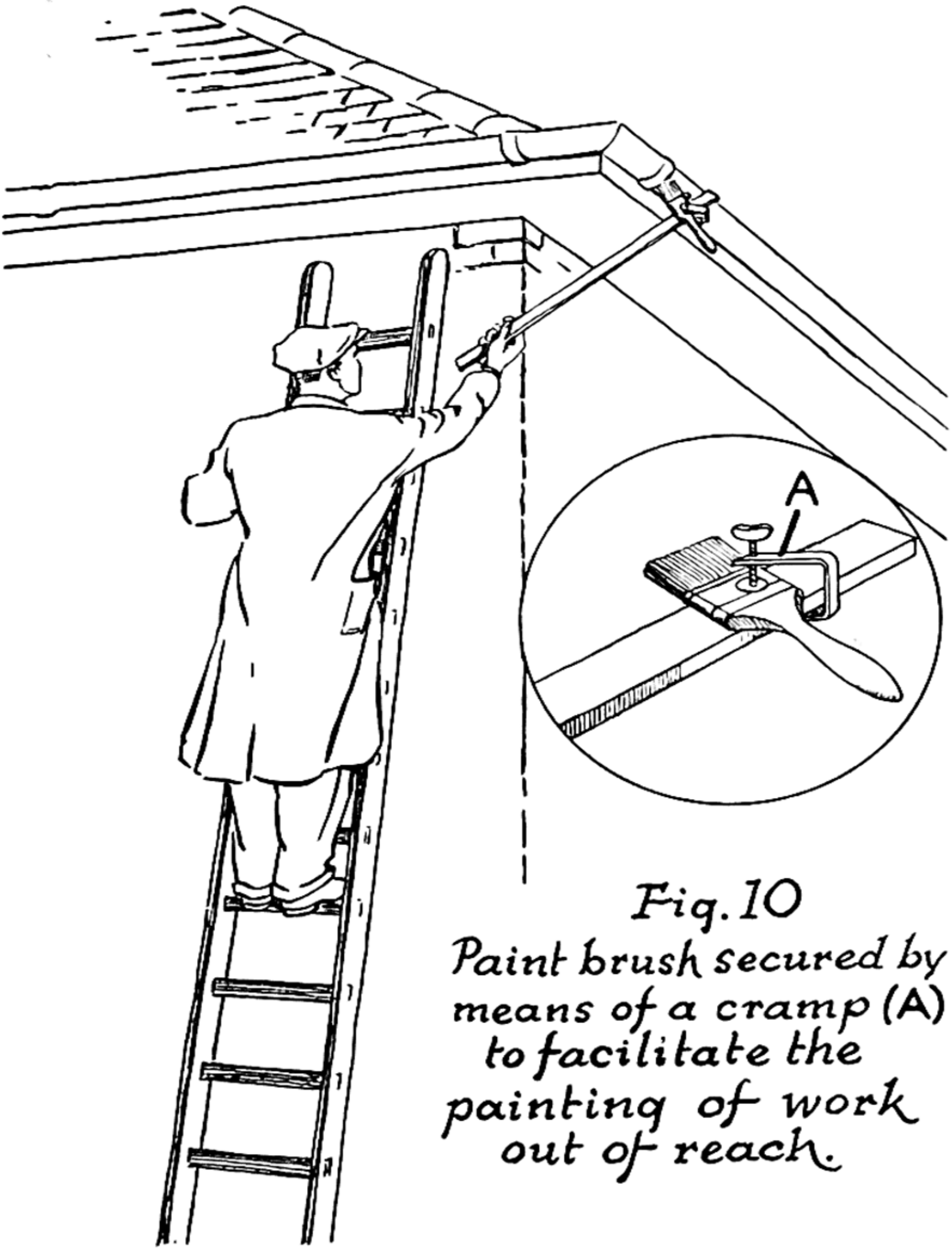


Fig. 10
Paint brush secured by means of a cramp (A) to facilitate the painting of work out of reach.

in weight, a cat-ladder enables one to pass with safety across a tiled, slated, or the more fragile asbestos roof. The latter is comparable with old corrugated iron, both being so deficient in strength that it is wise to place the ladder exactly over one or more of the supporting roof timbers; their position being indicated by the nail-heads.

A cat-ladder is usually constructed from a length of match-boarding, with cross-pieces of 1 inch by 1½ inches, situated at intervals of 1 foot. At one end, a cross-piece of 2 inches by 2 inches is nailed to the side underneath, the object being to hook the ladder over a ridge tile, or into a gutter, and thus prevent slipping.

Fig. 11 illustrates a precautionary measure likely to give additional support: without this aid, a gutter may be incapable of holding the weight. It is usual in such cases to make full use of an ordinary ladder which extends some 4 feet above the gutter and is firmly secured at the top or held by an assistant at the base. A fall-pipe offers the most convenient point for lashing, otherwise a small cramp may be fixed in such a manner as to provide the necessary attachment.

Planks or Scaffold Boards may prove helpful in numerous ways when doing odd jobs about the house. Painters' planks are usually 9 inches in width by 1½ to 1¾ inches in thickness. Their main uses in outside painting are (*a*) to carry and distribute the weight when painting the roofs of glasshouses or sheds; (*b*) to form a solid base for the ladder foot when painting a gutter or window-frame, awkwardly placed above a shed or veranda; (*c*) to use with ladder brackets.

Ladder Brackets (Fig. 12) form a convenient means of gaining access to points inaccessible from ladders. They can be fixed to the front or back of a ladder, as desired, and can usually be hired from the local builder. By

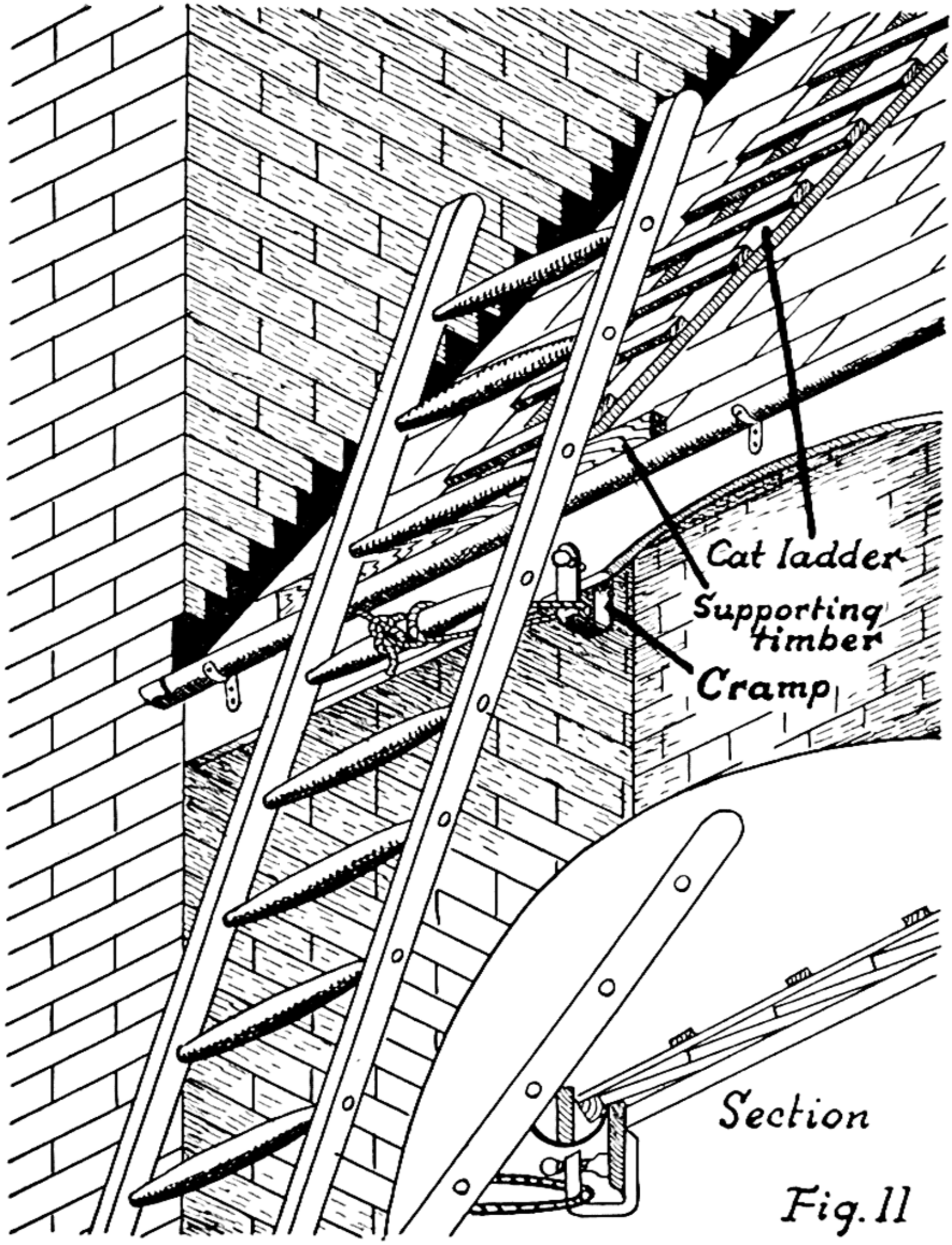


Fig. 11

A ladder bracket and plank facilitates the painting of work otherwise inaccessible

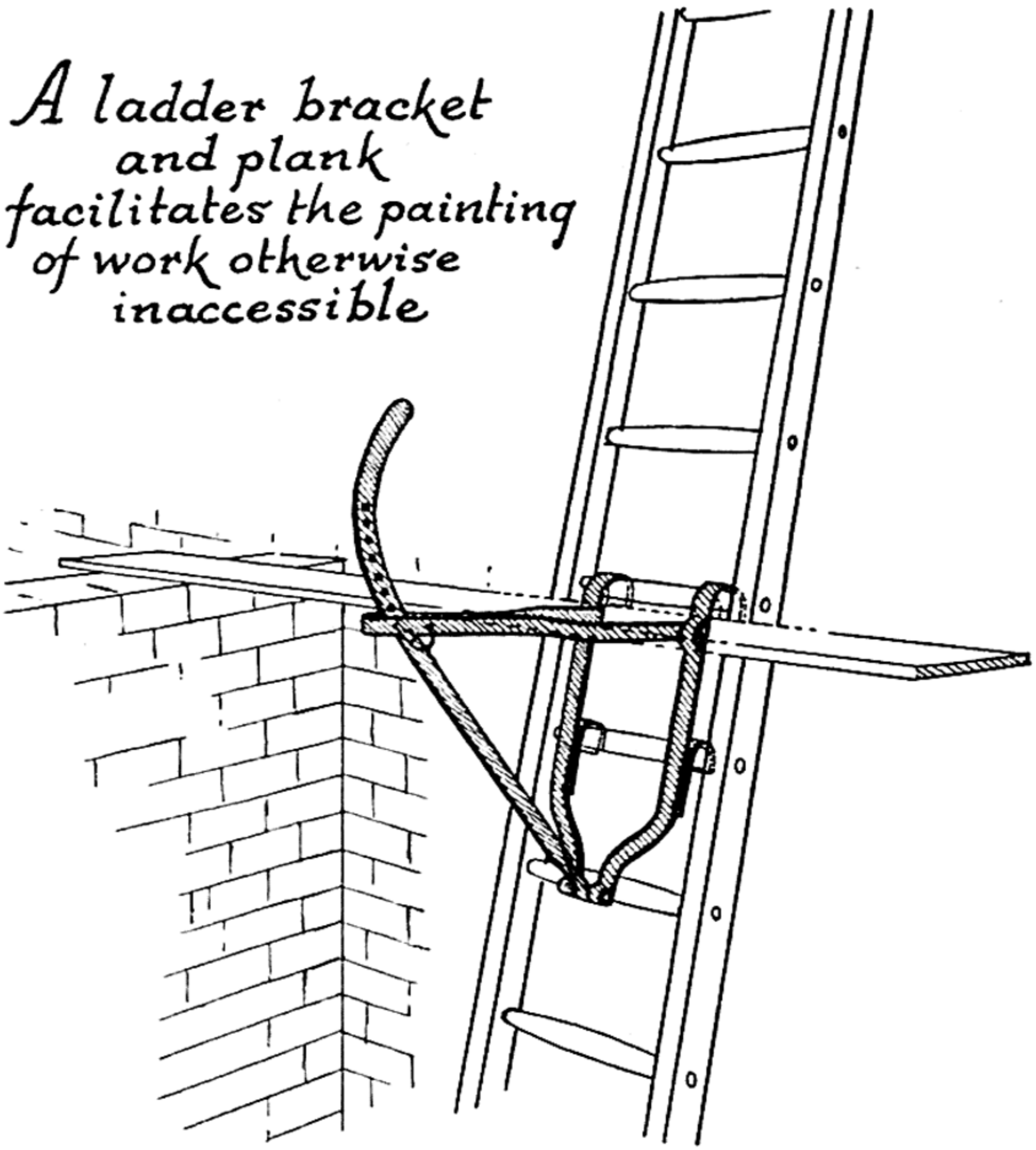


Fig. 12

means of ladders, brackets, and planks one can sit down to a day's mastic painting (filling the open joints of brick-work) in comparative comfort.

Tools and Equipment

The tools required are not numerous; they should, however, be of good quality and include the following (Fig. 13):

Chisel Knife

The blade is about 1 inch in width; thin and slightly flexible near the tip, and increasing in thickness towards the handle, through which it is riveted. It is mainly employed for stripping off old paint films, for levelling up hollow places with white-lead putty, and also as a general scraper for wood and ironwork.

Broad Knife or Scraper

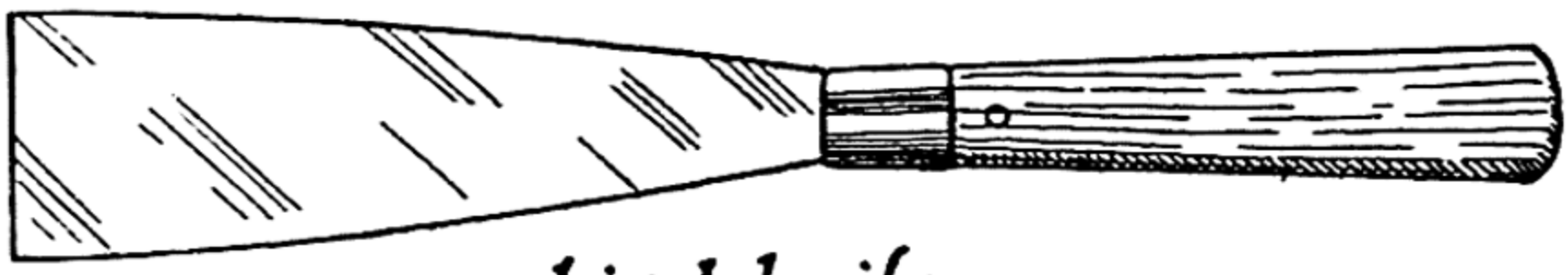
This is really a broad type of chisel knife with similar uses. A handy width of blade is 2½ inches.

Putty- or Stopping-Knife

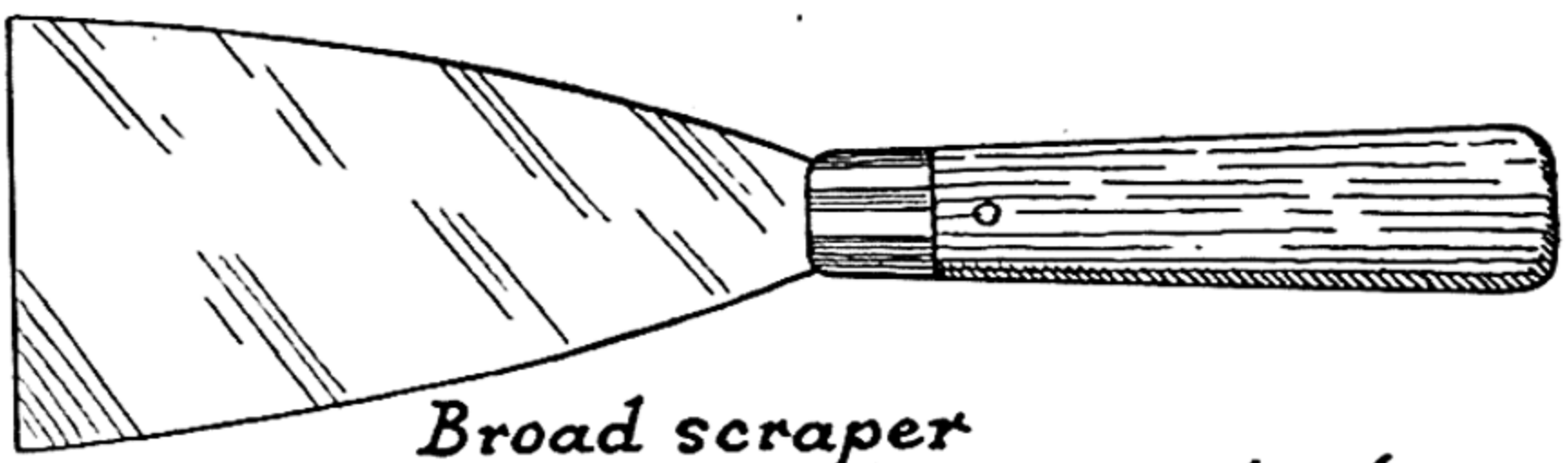
The best type has a pointed blade, rounded at one side and flat at the other. It is used almost exclusively for stopping-up nail-holes, cracks, etc., with putty. To do its job efficiently, the flat side must be kept clean, smooth, and straight. An old knife should be employed for opening paint tins, scraping rusty ironwork, and other rough jobs.

Shave-Hooks

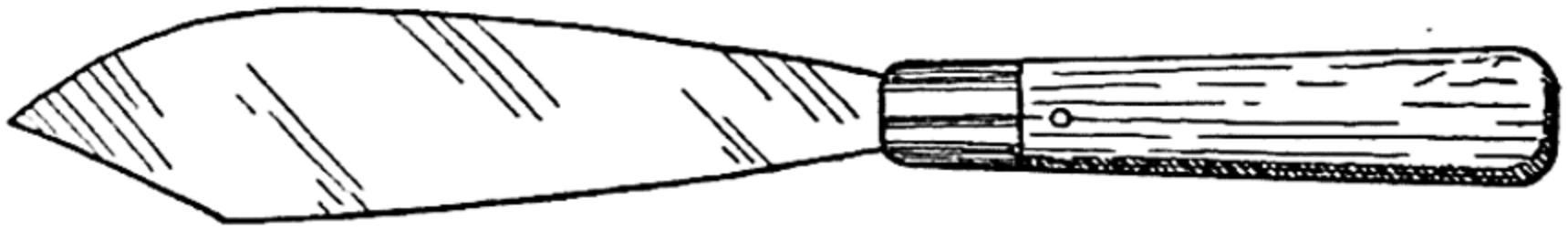
Are available with blades of varying shapes; these are necessary when burning off old paint from mouldings and for cleaning out the grooves of match-boarding. Those with a pear-shaped blade are more generally useful than the triangular variety.



chisel knife



Broad scraper
or Stripping knife



Stopping knife



Shave hook

Fig. 13

Trowels

There are three main types, each with special advantages for widely different jobs (Fig. 14).

The Gauging Trowel

This is the ordinary general-purpose tool employed for the mixing and application of small quantities of cement or plaster.

The Laying Trowel

This has a rectangular blade of about 10½ inches by 5 inches. It provides a means whereby large areas can be trowelled to produce a smooth and level finish in plaster or cement. A home-made variety is extremely useful when laying cement paths. A variation of this tool made entirely from wood is known as a *Float*: it produces a slightly rough texture.

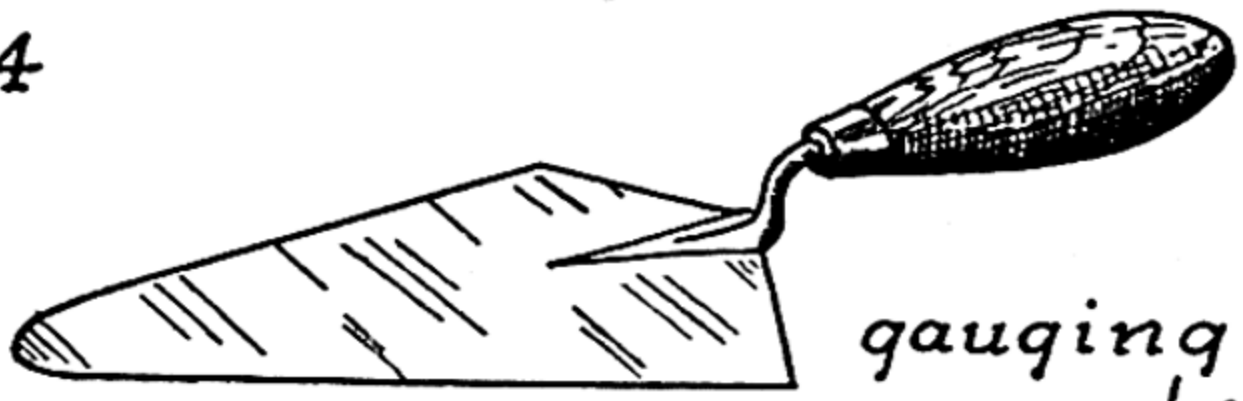
The Jointing Trowel

This is a form of pointing trowel which is specially made for filling open joints of brick or stonework, for cementing the angles between window-frame and brickwork, or for plastering in places inaccessible by the larger trowel. Jointing trowels vary from ⅜ inch to about 1½ inches in width and are used in conjunction with a small "hod."

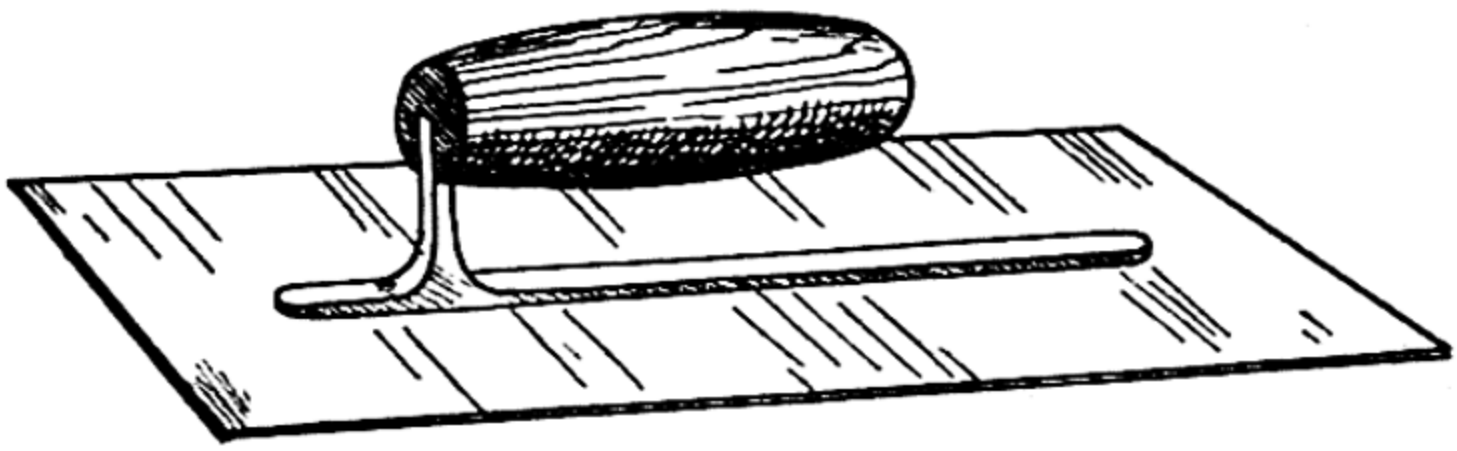
Hacking Knife

A knife of this type must withstand continued hammering; the blade should therefore be of stout metal and extend throughout the full length. A handle is formed by riveting pieces of leather on either side, and this serves as a shock absorber when hacking or chipping away the old putty prior to re-glazing (Figs. 14 and 26).

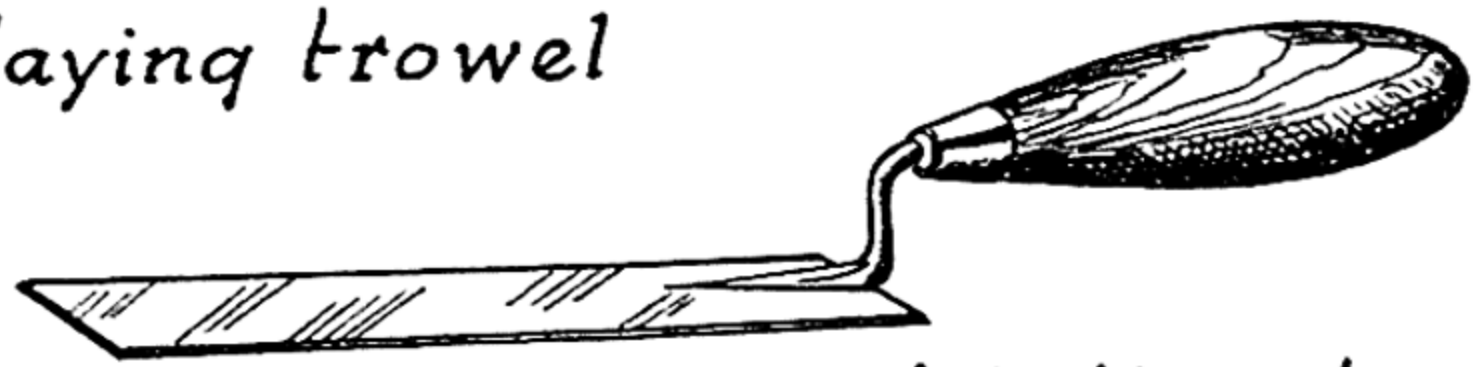
Fig. 14



gauging trowel



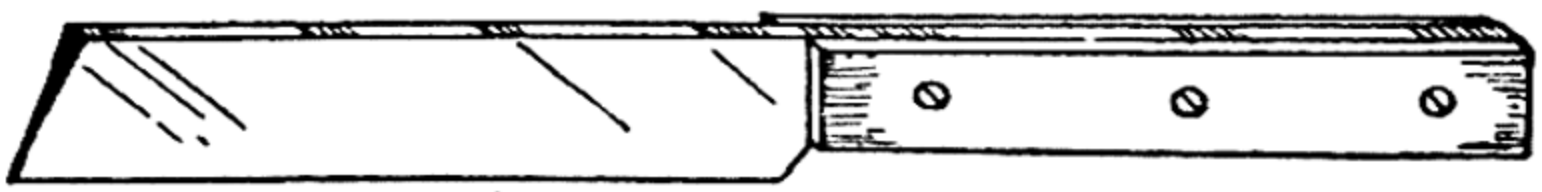
laying trowel



jointing trowel



wood float fitted with metal blade for plastering



Hacking knife

Glass-Cutter

The wheel type is cheap, efficient, and more easily controlled than a glazier's diamond. A good wheel can sometimes be re-conditioned upon an oil-stone, but this should not be necessary until something like 100 feet of glass has been cut. Spare wheels are usually obtainable from a hardware dealer.

Other items equally necessary for the cutting of glass include (*a*) a perfectly flat bench or table; (*b*) wooden straight-edge, slightly longer than the glass to be cut; (*c*) pliers with which to nip off any jagged pieces; (*d*) some means of forming a right angle—the corner of a newspaper, etc., placed beneath the glass will serve instead of a tee-square; (*e*) a 2-foot rule, and—as a safety measure—a pair of glasses or goggles. The whole operation is dealt with in Chapter II.

Sieves or Strainers

These are a necessary aid during the preparation of any type of paint. A fine-mesh muslin or its counterpart in wire gauze is suitable for oil paint, but a more open mesh—such as perforated zinc—is required when sieving distemper. Both types can be home-made; the first from a discarded gravy strainer, or the upper part of a paint tin (Fig. 15); the second is made from a wooden box, the bottom of which is removed and replaced by perforated zinc. A triangular frame forms a useful means of support when the bucket or paint tin is too large for the sieve.

Blow-Lamps

A blow-lamp is useful for many odd jobs apart from the removal of paint, and it matters little whether the lamp is a paraffin or a petrol-burning type. There are, how-

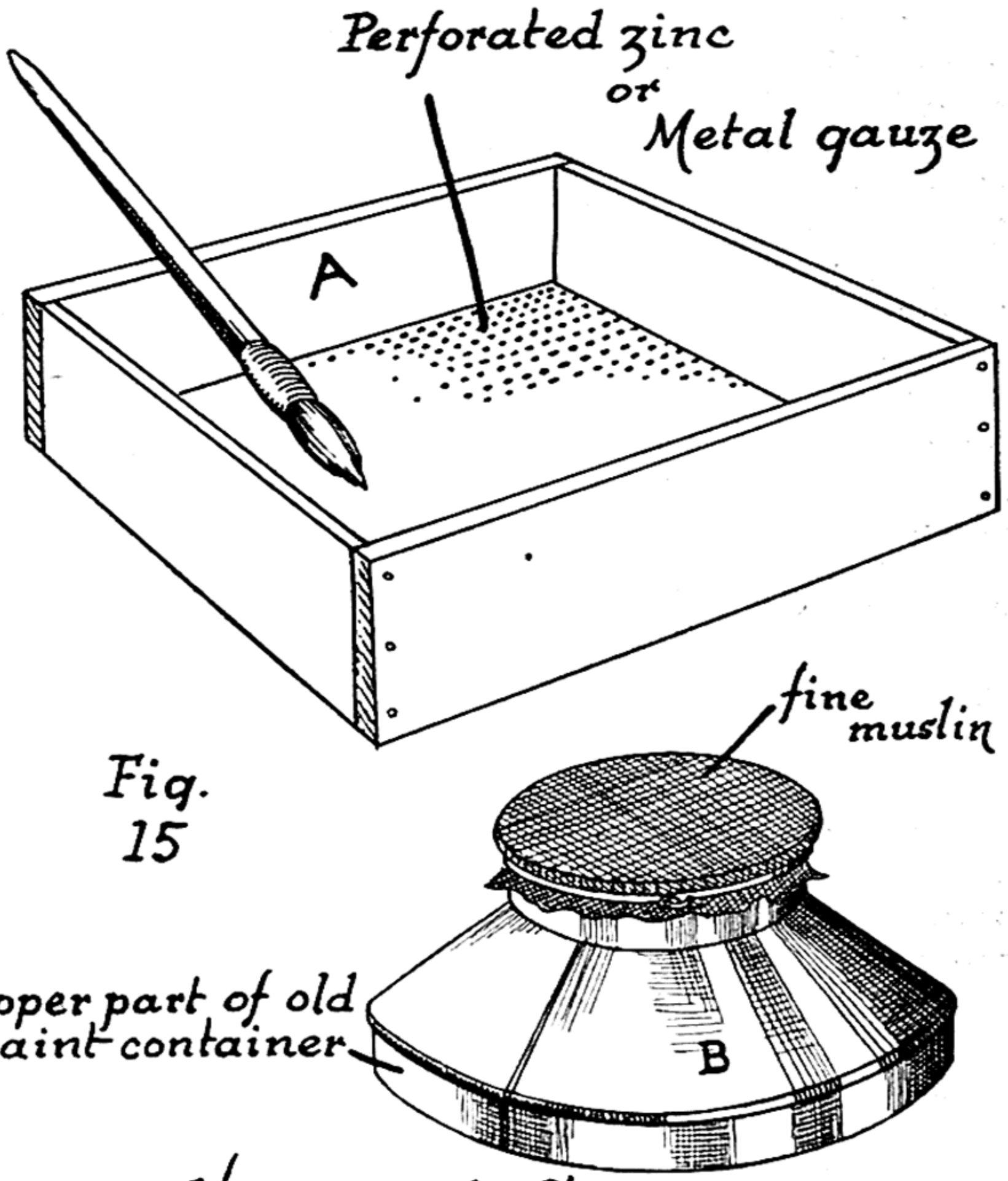


Fig. 15

Home-made Strainers

(A) is suitable for use with distemper, paperhanger's paste etc

(B) Forms an efficient strainer for oil paint.

ever, some differences to be noted in connection with their management.

The Petrol Blow-Lamp

This is light in weight and gives a hot flame free from soot and grease. Petrol vaporises quickly, and thereby saves time when lighting. It is wiser to use a high-grade fuel such as .680 spirit (or similar quality) than to risk a cheap fuel which chokes the nipple with soot.

The type illustrated (Fig. 16) is self cleaning; a needle point attached to the valve-stem pierces the aperture of the nipple each time the valve is closed. In the tube, which is a central feature of petrol lamps, there is a cotton wick; this controls the evaporation speed and, to some extent, the force of the flame. After a time the upper part becomes coated with a hard film of burnt oil which slows down and eventually prevents the free passage of petrol vapour. At this stage the old wick is extracted with the aid of a metal hook, and renewed: a screw cap at the base is removed for this purpose.

Now for instructions concerning lighting, safety, and upkeep of a lamp:

(1) A lamp should not be filled to the top: three-quarters full is a suitable amount.

(2) Screw down the filler-cap tightly, and close the valve.

(3) Remove the lamp to a sheltered spot out of doors; fill the small reservoir with petrol, and place the petrol can at a safe distance.

(4) After igniting the spirit in the reservoir it is advisable to keep the valve closed for a minute or so before giving a half-turn to ascertain whether vaporisation has commenced. Until this occurs, the valve is kept closed or nearly closed, otherwise a jet of burning petrol is thrown out, hence the need for a safe place for lighting

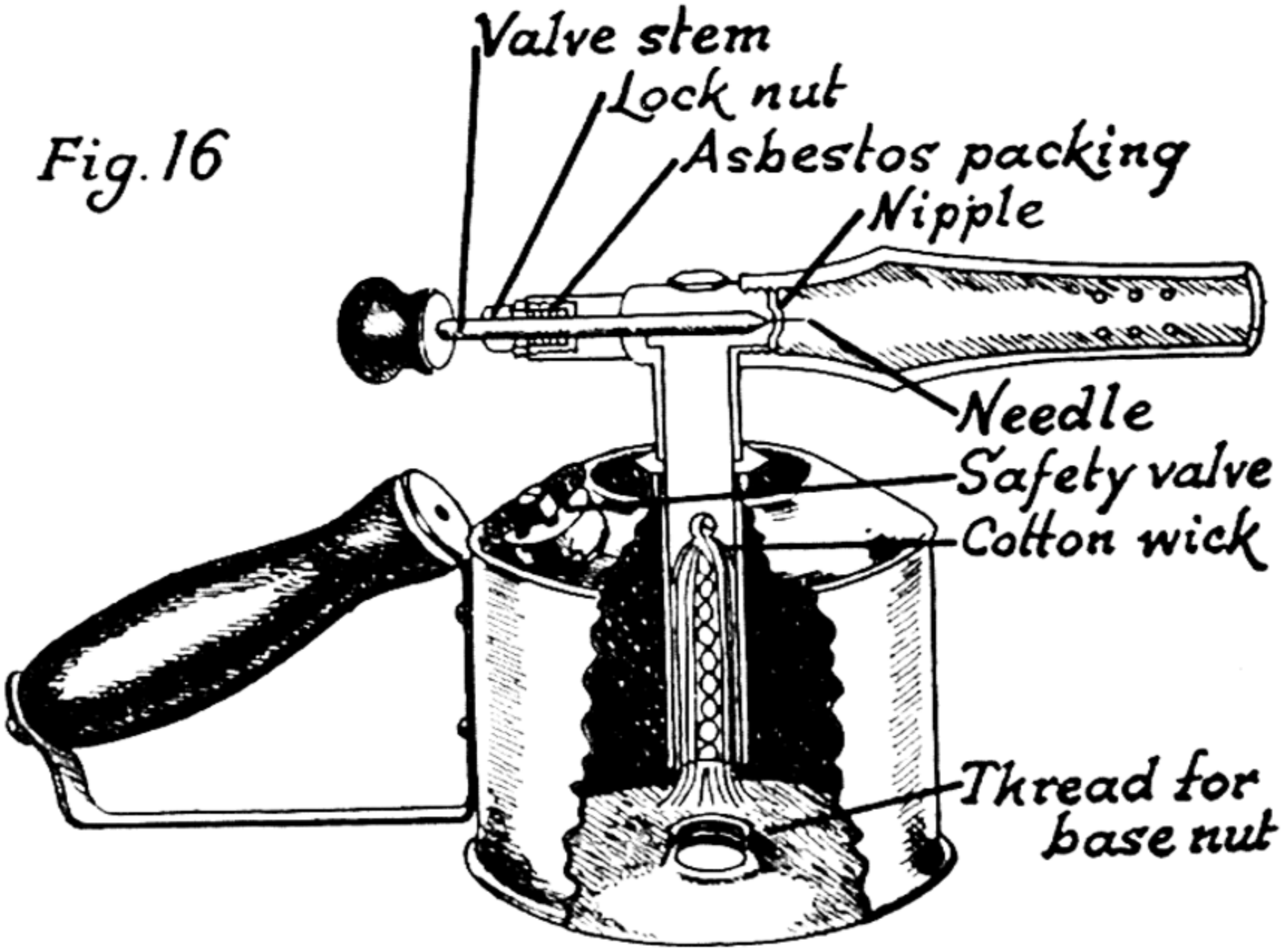
the blow-lamp. The valve may be fully opened when the spirit is vaporising steadily.

Minor Defects

These will occur sooner or later, yet, with reasonable care, they can be postponed indefinitely. A blow-lamp

PETROL BLOW-LAMP

Fig. 16



Interior of Petrol Blow-Lamp

will refuse to function (*a*) when the vapour cannot escape by the normal outlet, or (*b*) when there is a leakage at some other point. In the latter case the escaping gas usually ignites and indicates the weak spot.

There are four points which may permit leakage: (1) The filler-cap; (2) the sleeve of the valve; (3) the outer edge of the nipple, and (4) the cap beneath the lamp. Nos. (1) and (4) indicate either the tightening of the cap, or the need of a new cork washer, the latter being procurable at any hardware shop. The filler-cap should not be screwed down with pincers, as this procedure is liable to tear the washer and result in leakage.

Defect No. (3) is easily made good. The flame tube is unscrewed (anti-clockwise) and the nipple removed by leverage with a penknife and scraped or glass-papered behind. The seating should also be examined and any grit removed: before reassembling, see that the aperture is clear.

A leaky valve sleeve should be dealt with immediately. The trouble is usually due to shrinkage of the asbestos packing, and, as its replacement is an expert's job, we must take steps to restore its original tightness. This is sometimes achieved by the addition of a small piece of tallow at the time of filling the lamp. This substance melts and works its way to the valve, checking any slight escape of vapour.

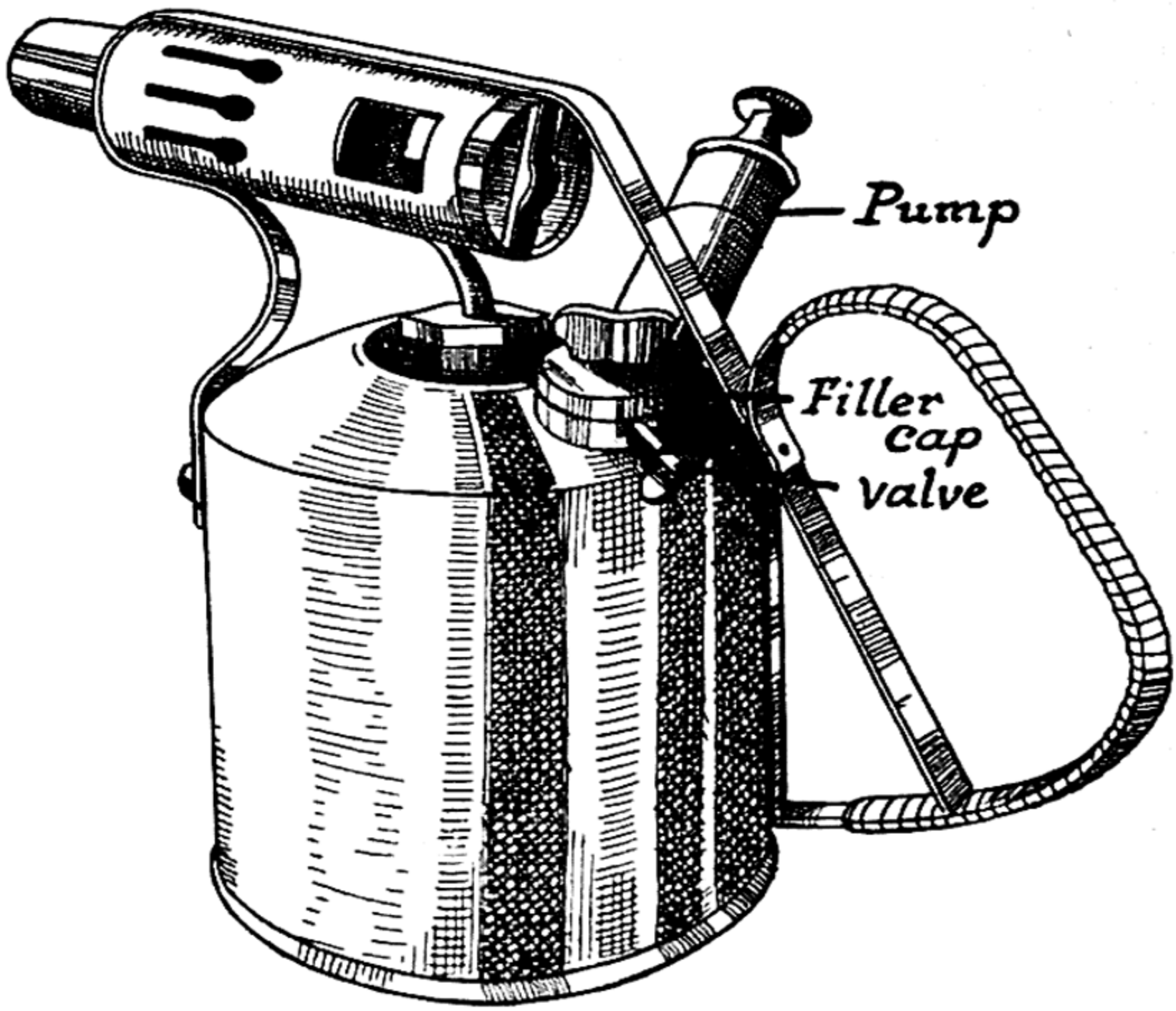
Any lamp refusing to operate after these points have received attention is almost certain to require a new wick.

Paraffin Blow-Lamps (Fig. 17)

These work on the same principle as a "Primus" stove: there is no wick, the fuel vaporises and pressure is increased by an air pump. The lamp will only operate when the valve at one side of the filler-cap is closed: when this is opened (turned anti-clockwise) pressure falls and the flame dies out. Although paraffin is employed as fuel, the outer reservoir may be filled with petrol to gain a quick start.

All blow-lamps are equipped with some form of safety-

Fig. 17



PARAFFIN BLOW-LAMP

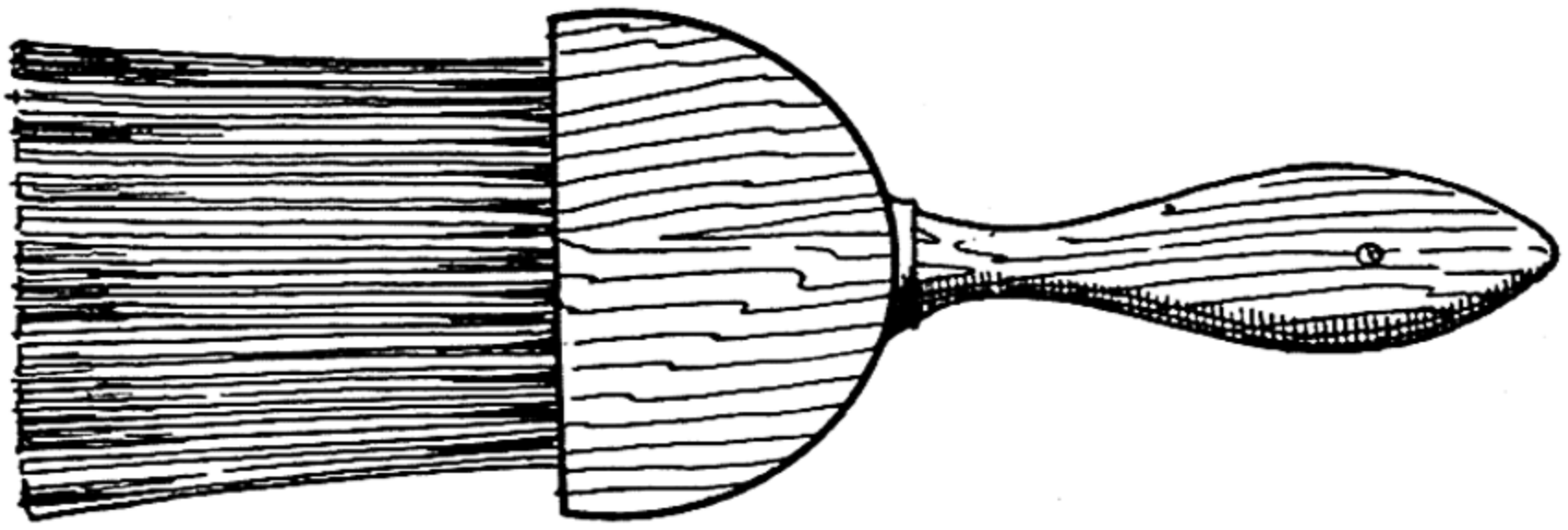
valve, and these should not be tampered with. The pump washer requires to be kept moist with an occasional drop of oil, to counter the effects of heat. The valve situated at the base of the pump may spring a leak because of the presence of grit. It is not difficult to remove and clean the parts concerned, but it is much easier to sieve the paraffin when filling: incidentally, a "pricker" is required for cleaning the aperture of this type of lamp.

Brushes

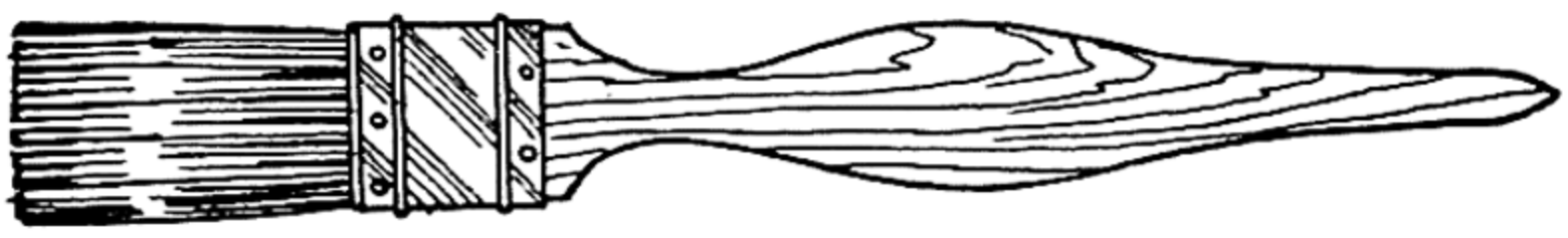
The brushes required for exterior work are comparatively few in number, and, apart from a cheap vegetable fibre brush—for use in tar, creosote, or caustic soda—they should contain hog's-hair bristles, set in rubber cement. A good brush is always "good value for money spent," and it is wise to follow the painters' example and purchase the goods of a reputable British firm such as Hamiltons. A paint brush of the right quality does not shed its bristles nor develop a permanent twist after one day's work: it retains its quality until worn out.

The Dusting Brush is in constant use at every stage of a painting job. It should be large enough to "dust" or sweep the dust from doors, shelves, inside gutters, etc., and be equally effective in corners as upon broad surfaces. The type used by painters is called a *Jamb Duster* and, compared with its size—4 inches by 1¼ inches with 4-inch length of bristle—the cost is very low. The bristles are set in pitch, in a wooden handle, yet they withstand repeated washing and remain in good condition for years.

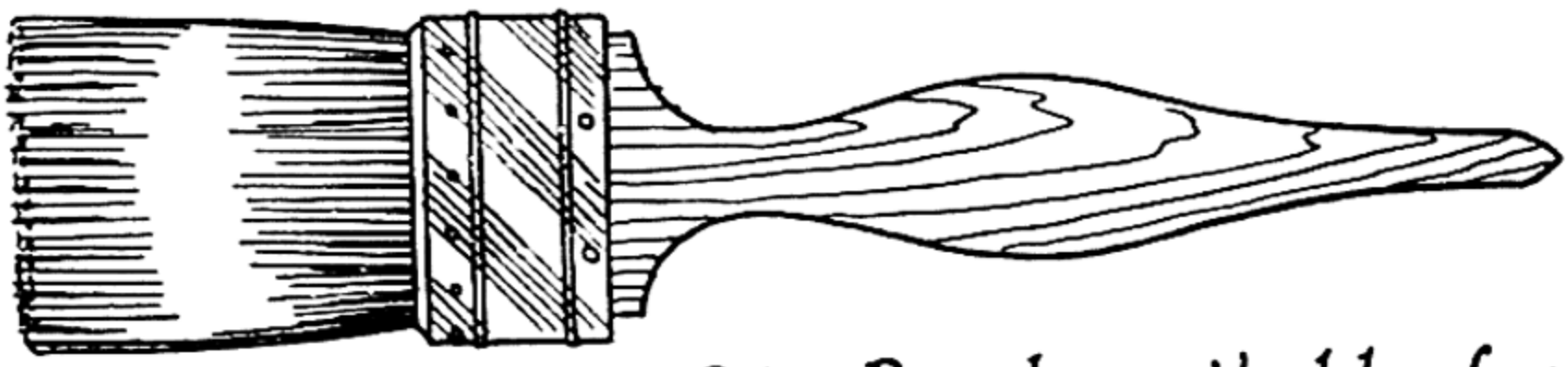
There is, of course, no reason why another type of brush should not be used for the same purpose, but unless a suitable article is already available, a jamb or flat duster is worth its place in our stock: it also makes a good tool for brush-graining (see Fig. 18).



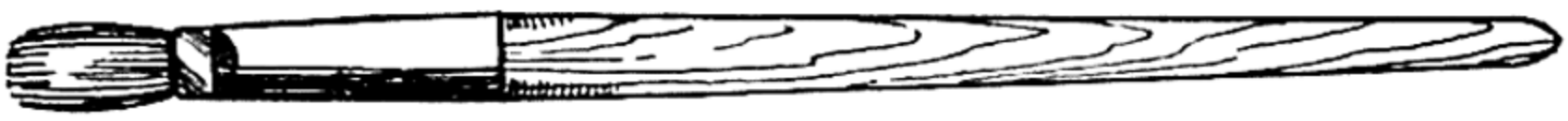
Jamb duster



1in. Flat paint or varnish brush



2 in. Brush, suitable for doors and other woodwork



Flat Fitch

Fig. 18

Selecting a Good Paint Brush

The appearance of a brush is no indication of its quality; the latter can only be proved by its behaviour when in use. There are, however, a number of points which are of great assistance to the buyer. Brushes manufactured by reputable British firms are usually stamped " British "; the use of rubber cement is also stated, or indicated by the term " Vulcaset " or, " set in vulcanised rubber."

The shape of the handle is of little consequence; it is the quality of bristle and its setting which are the all-important factor. The majority of present-day brushes are equally suitable for use in paint, enamel, or varnish, hence the name " flat paint or varnish brushes." The bristles are held firmly by a metal ferrule, some types being seamless, others being riveted: the former are easily cleaned, the latter, lighter in weight and cheaper in price.

Bristles may be white, grey, or black, the latter being more generally used. A brush should be stamped " all bristle " or " pure bristle," otherwise it may contain a mixture of hog's hair and horsehair; to the detriment of the quality. It is usual to employ full-length bristle in good brushes; each bristle tapers from base to tip, thus combining strength and springiness with fineness at the point where it is most needed. This gives a bevelled appearance to the brush and enables it to be used for any class of work without the preliminary " wearing in " necessary for coarse brushes.

True bristle is straight and is usually split at the tip, whilst horsehair is the same width throughout. The latter is deficient in " spring " and is easily detected. The thickness at the tip of a brush can be assessed by pressure between finger and thumb; it should be about one-third the thickness of the base.

A suitable outfit would include brushes of 1 inch to 1½ inches and 2 inches in width: these being generally useful for the painting of doors and window-frames. A small brush, known as a flat fitch, is particularly useful for painting behind fall-pipes, etc.; the No. 6 or No. 8 is a convenient size (Fig. 18).

For the painting of cement and other large areas it is better to use a 4-inch brush, but for the application of oil-bound distemper or other waterproofing compound a 6-inch distemper brush is preferable (Fig. 19). In some parts of the country a round brush, known as a "Turk's head," is widely employed for lime-washing and other rough work.

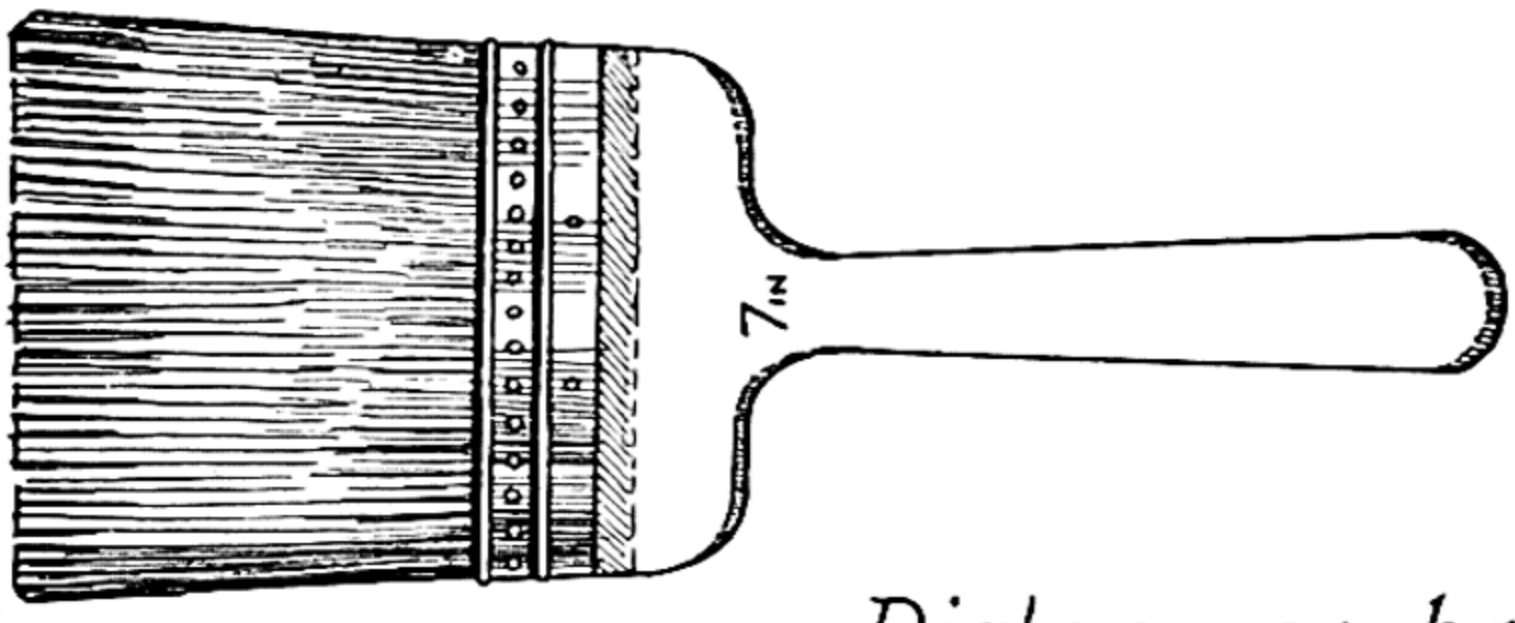
A sash tool is capable of giving good service, but it is not suitable for the amateur. It is difficult to control and does not withstand the intermittent use, washing out, and storing. The string binding is liable to rot.

The spout brush is equipped with a stout wire handle which can be bent into various shapes in order to paint those parts of railings, etc., which are otherwise inaccessible: the handle is about 20 inches in length.

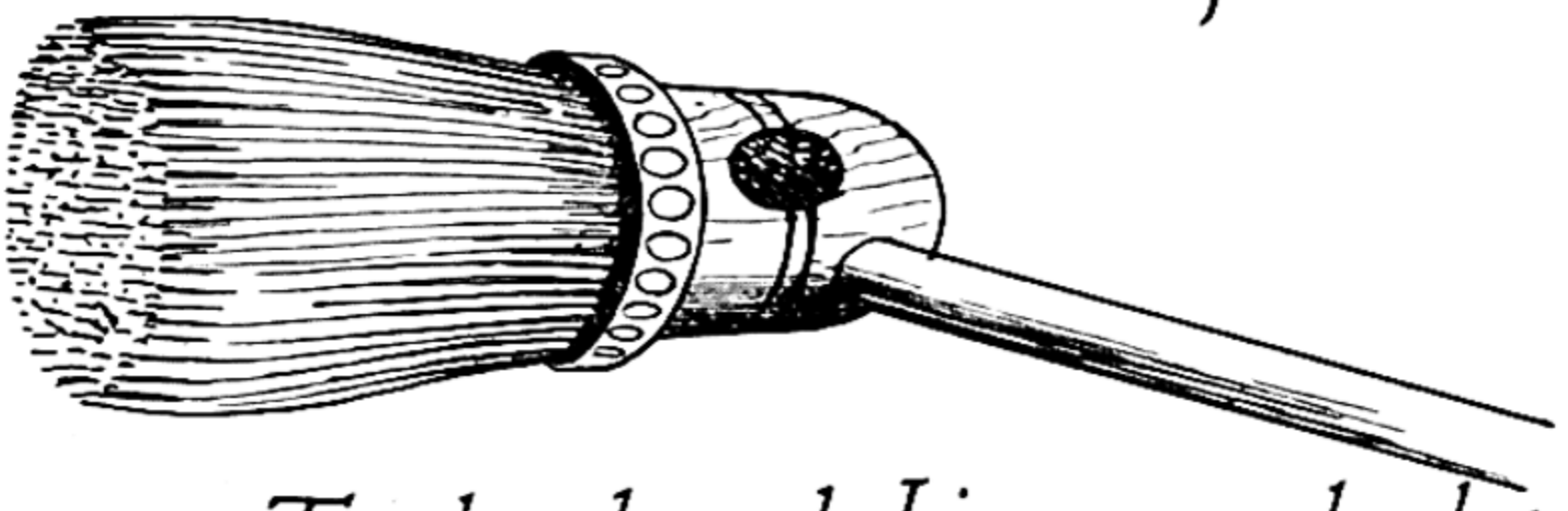
Materials

Before proceeding with the consideration of paints, varnishes, distempers, and sundries, we should first appreciate the vast difference between exterior and interior conditions. On outside work our paints and varnishes are exposed continuously to the destructive effects of wind, rain, frost, chemical action, and sunlight: the latter pair being the most damaging of all.

Another factor which contributes to the breakdown of a paint film is due to climatic changes which cause considerable movement—swelling and shrinkage—in structural woodwork. Chemical action is set up by damp soil and by deposits of soot which settle upon window or



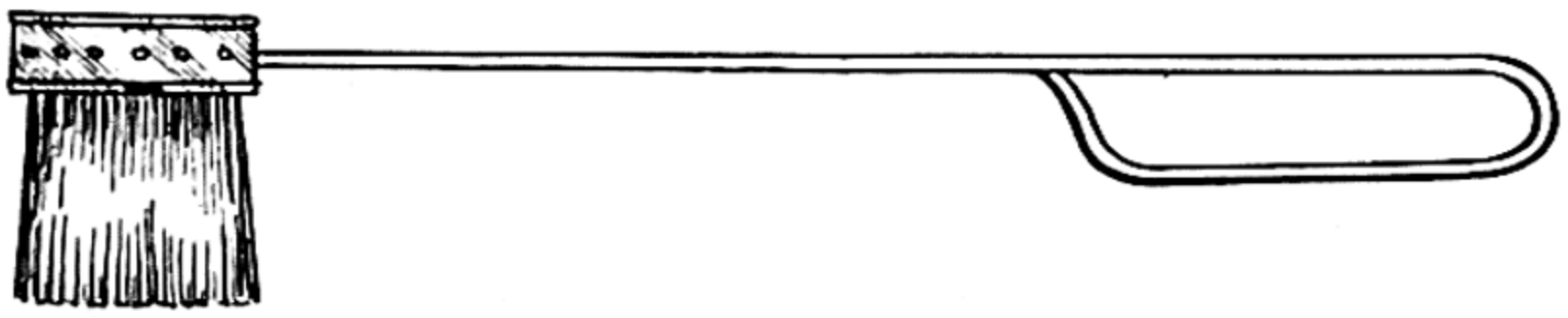
Distemper brush



Turks head Limewash brush



Sash tool (string bound)



Spout or Radiator brush
(The wire handle can be bent to any angle)

Fig. 19

other ledges: even the rain is not entirely free from injurious compounds.

Interior work, because of its sheltered position, will usually remain in good condition for anything up to thirty years—*i.e.*, almost ten times longer than outside work. There are, of course, certain exceptions, such as window-frames, kitchens, and bathrooms, which are exposed to moisture, steam, and condensation.

It will be obvious from this comparison that only the best of materials are good enough for outside work, and that cheaper and vastly inferior paints can be employed with success upon interior work: hence the different qualities of ready-mixed paints and enamels.

The Difference Between "Outside" and "Inside" Paint

The chief difference between an "outside" and an "inside" quality of paint or varnish lies in the flexibility of the film. For outside work the coating or film must remain flexible in order to expand and contract in proportion to the movement of timber surfaces. When the film becomes hard and brittle it breaks down, and is no longer effective as a preservative.

Hardness and brittleness are of little consequence in paints for interior use, in fact these properties are often desirable, as in the case of flat-paints for wall or ceiling decoration. Such material would only last for a few months if exposed to the weather, but an outside paint could be used with safety indoors: there is, however, the possibility that an outside quality may prove rather too soft for interior work—except for window-frames.

The flexibility of a paint or varnish is controlled by the proportions of linseed oil and turpentine. By using five parts of oil to one of turpentine we obtain a glossy and flexible coating, but if these proportions are reversed the film becomes dull and hard. It is the oil which

causes the paint to dry and which produces the characteristic toughness.

Resin forms an important ingredient of high-gloss paints and varnishes: when of good quality this substance improves gloss, toughness, and weather-resisting properties. The solid colouring matter which forms the body or base of a paint can also affect the durability to a marked degree and it is a well-known fact that white lead is unequalled as a base for outside paints. There is another ingredient termed " driers " which enters into the composition of oil paints. This substance is described under the appropriate heading.

Ready-Mixed Paints are of two classes: (*a*) undercoats, and (*b*) finishes. In most cases the manufacturer supplies undercoats of a type and colour suitable for each finish. It is desirable that each should contain a proportion of white lead, but this is not always possible in the case of dark colours.

In the thinning of ready-mixed paint, the manufacturer's instructions must be strictly observed. It is usually possible to add equal parts of oil and turpentine (or oil and white spirit) to an undercoat, but gloss finishes should not be tampered with. The addition of turpentine is distinctly damaging to the gloss, and oil will not only delay drying but may set up chemical action and cause the paint to thicken. When purchasing material for outside use, make sure that the goods are from a reputable firm and capable of withstanding outdoor conditions.

Undercoats

Here we must use the plural, because the type of undercoat supplied for use beneath an ordinary gloss paint is rarely capable of meeting all the requirements of outdoor work. It is really the final undercoat, to be

applied when all the necessary preliminaries—priming, puttying-up, touching-up, etc.—have received attention and all surface porosity has been overcome by preliminary coatings.

It is a general rule that final undercoats must dry with a dull or matt surface and, as previously pointed out, a flat-paint possesses little durability, hence the necessity of at least one preliminary undercoat of good-quality lead paint of a semi-gloss type and suitable colour.

Work which is to be painted, grained, and varnished, or painted and varnished, can be coated from start to finish with lead paint, but if the job is to be finished in white enamel, the final undercoat must be of zinc white. If the enamel were applied directly upon lead paint the work would rapidly discolour.

Priming Paints are of several types, the composition varying according to the particular purpose of each. To clarify the subject, a " priming paint " is the first or primary undercoat to be applied upon a new—unpainted—surface. This means that any kind of paint used for this purpose is a priming paint. Thus the operation of first coating a new surface is termed " priming," but if the surface is old and previously painted we use the term " first coating " to denote the first of a new series of coats.

Ready-mixed priming paint is an ordinary white-lead paint, tinted to pale pink (by the addition of red lead), and containing linseed oil and turpentine in the proportion of two to one. The oil penetrates into and preserves the surface painted, and the red lead dries and hardens the paint. An ordinary lead paint can be thinned for use in the same manner, and if the oil is treated with about 5 per cent. of " terebine driers " the red lead can be dispensed with: a good priming paint is thus produced.

Aluminium Primers contain both white lead and aluminium. These are quite durable, and possess the

following advantages: they dry quickly, possess good anti-corrosive and obliterating qualities; they rarely blister, and can be applied to new woodwork without any preliminary treatment to the knots.

Patent Knotting is a quick-drying varnish prepared from orange shellac and methylated spirit. This dissolves overnight and forms a spirit varnish equally useful in french polishing, in the preparation of quick-drying paints, or for the treatment of knots, tar, creosote, Columbian pine and other surfaces which require special treatment before painting. Knotting can, of course, be purchased as a ready-prepared material.

Driers are a necessary ingredient in almost every type of oil paint and oil varnish. They enable the paint to dry in six to twelve hours instead of as many days, but there are strict limits as to the amount added: an excessive quantity injures the durability of paint and causes cracking.

Driers may be purchased in either of two forms: (*a*) as "*Terebine*" or "*Liquid Driers*," or (*b*) as "*Paste* or *Patent Driers*." Both are ready for use, the liquid variety being the more powerful and convenient form. Each contains chemical substances termed "driers," but these are too highly concentrated and are therefore reduced in strength to render them safe.

The Use of Driers

Driers are not added to ready-mixed paints and varnishes, provided that these are thinned in accordance with the manufacturer's instructions. There are, however, occasions when it is desirable to increase the amount of refined linseed oil in one or more of the undercoats, and in such cases we add 1 ounce of terebine to 16 ounces of oil, or, in the case of paste driers, 1 ounce of paste to 3 ounces of oil.

These proportions are equally correct for home-made paints; the paste drier, being pale (rather like putty) in colour, is preferable for white and pale tints, but the terebine is dark brown and more suitable for use in medium or dark colours.

Turpentine Substitute

Although genuine turpentine is acknowledged to be the best thinner for oil paint the supply has long been inadequate, and we are obliged to fall back upon the popular substitute—*White Spirit*. A good brand is clear as water, and, if splashed upon white paper, should dry out, leaving no stain. Should there be evidence of grease, the material should be rejected, because its presence in paint would delay drying and prevent the proper hardening of the paint.

Linseed Oil is available in two forms: (*a*) refined linseed oil, and (*b*) boiled oil. The first named is pale in colour and is mainly used in undercoats and pale finishing coats —including white. Boiled oil is dark in colour; thicker, and, in consequence, more glossy: it contains a small percentage of driers and because of this we add only half the amount of terebine specified for refined oil. Boiled oil is used in paints intended for ironwork, skylights, gutters, and other exposed positions. It is sometimes possible to obtain "pale boiled oil," a variety which is particularly useful in the more delicate tints.

Varnishes

"Outside Varnishes," sometimes termed "Elastic Varnishes," are used exclusively for outdoor work. All are similar in character—*i.e.*, they contain linseed oil, resin, turpentine, and driers—and are therefore known as oil varnishes. There are, of course, several grades, which vary according to the quality and colour of the resin

employed, and while price is a good indication of quality, the name of a varnish describes the colour. There is, in fact, a range which embraces the following: Dark Oak Varnish, Copal Oak Varnish, Pale Copal Oak, Extra Pale Copal, and White Coburg. All are described as clear varnish, but none are so colourless as to permit their use upon white paint.

Synthetic Varnish

This is an oil varnish containing an artificial or synthetic resin. It is quite durable, reasonably pale in colour, and possesses the advantage of drying within the space of a few hours. Some types are rain-proof and dust-proof in a little over two hours.

Synthetic Enamels

These are high-gloss paints prepared from synthetic varnish and a suitable proportion of finely ground colour. They possess qualities similar to the varnish from which they are prepared, but there is one important difference: some varieties require a special undercoat, others can be applied directly upon an ordinary white-lead undercoat. This point should be ascertained at the time of purchasing.

Bituminous Paint

This is obtainable in black and also in a limited number of shades, including dark brown, green, blue, or grey. These paints have been found to give good service when used upon cement or ironwork, and exposed to unusually rigorous conditions, as, for example, the insides of gutters, and positions in contact with soil. There is one possible objection to their use, and that arises when the work is due for re-painting: the same type of material must be employed because an ordinary paint is liable to remain

tacky and to develop considerable discoloration if applied directly upon a bitumen product. It is, of course, possible to interpose a coating of aluminium paint to neutralise the old surface, but this involves additional expense.

Anti-Corrosive Paints

In addition to bituminous materials there are several others of undoubted merit.

Red Lead, mixed with two parts boiled oil to one of turpentine, is particularly good as a priming or under-coat upon ironwork. It is useful for touching-up bare places prior to the re-painting of metal window-frames, tanks, gutters, garden rails, etc. Its brilliant orange colour can be toned down by the addition of black paint, and, because of its powerful drying properties, it is never combined with other driers.

White Lead may be used alone, or combined with any proportion of red lead, to form an efficient coating for this purpose. It is important that the lead be genuine carbonate of lead and not the inferior sulphate of lead.

Graphite is a form of black lead with good anti-corrosive properties. It is available in several dark shades and its spreading capacity is remarkably high.

Red Oxide is composed mainly of iron oxide. It may be used alone or in combination with red and white lead, for the protection of iron surfaces.

Water Paint or oil-bound distemper is of two types, one for interior work, the other for use upon external stucco and cement surfaces. It forms a waterproof coating, is cheaper than oil paint, and is applied quickly and easily. To be really effective it must be mixed in accordance with the instructions given, which usually means thinning with a special medium (termed petrifying liquid) supplied by the manufacturer.

Creosote and other coal-tar products provide a cheap and effective preservative for fences, sheds, and innumerable articles of woodwork exposed to the action of weathering. Such surfaces should receive a very liberal coating, applied during a dry spell and any parts in contact with earth should be bared and, when thoroughly dry, coated with the solution. Wherever possible, an air space is left to permit free ventilation to every part of the work, for the contact of soil against woodwork may cause rot within a year. Creosote which has thickened as a result of long storage may be thinned with paraffin.

Putty

It is not generally known that there are two varieties of putty: (*a*) painters' putty, made from whiting (chalk) and refined linseed oil, and (*b*) glaziers' putty, prepared from whiting and an inferior drying oil. Each is ideal for its particular purpose, the former being preferable for work about the house; the latter, because of its slow-setting nature, is more suitable for greenhouses and roof-lights. There is another good reason why glaziers' putty should not be employed during painting operations: in some cases the oil rises to the surface and discolours the new paintwork within a few weeks of completion.

It is an advantage, when stopping up nail-holes, open joints, etc., to use a quick-setting putty. This can be prepared by adding a little whiting and quick gold-size (a quick-drying varnish) to painters' putty, or, alternatively, by the addition of a little red lead and/or white lead. In either case the quality, strength, and hardness of the putty are vastly improved.

CHAPTER II

PREPARATORY PROCESSES AND MINOR REPAIRS

Repairing and waterproofing of cement-work.—Pointing of brick and stonework.—Glass cutting and glazing.—The treatment of old paintwork.—Rubbing and washing down.—Removal of paint and varnish.—The painting of new woodwork.

In planning this chapter we cannot do better than follow the normal and sensible procedure adopted by a good craftsman. Repairs to the main structure of a house are too often overlooked, so we take this opportunity of pointing out the folly of painting window-frames, etc., and neglecting to repair open cracks between frames and surrounding brick- or cement-work. Such jobs should be tackled at the earliest possible moment in order to get rid of dust and allow time for the hardening and drying of the cement.

The Pointing of Window-Frames

Because of the shrinkage of the woodwork or surrounding cement-work, or as a result of vibration, these cracks develop at regular intervals. In such situations it is obviously advantageous to employ a plastic compound rather than a hard Portland cement or similar mixture. The substance we would recommend is *mastic*—dry silver sand containing 5 per cent. of red lead—mixed to a stiff paste with boiled oil. Mastic is usually obtainable from any builders' merchant, but if this cannot be procured, a substitute can be prepared from plaster of paris, gloss paint, and a little boiled oil.

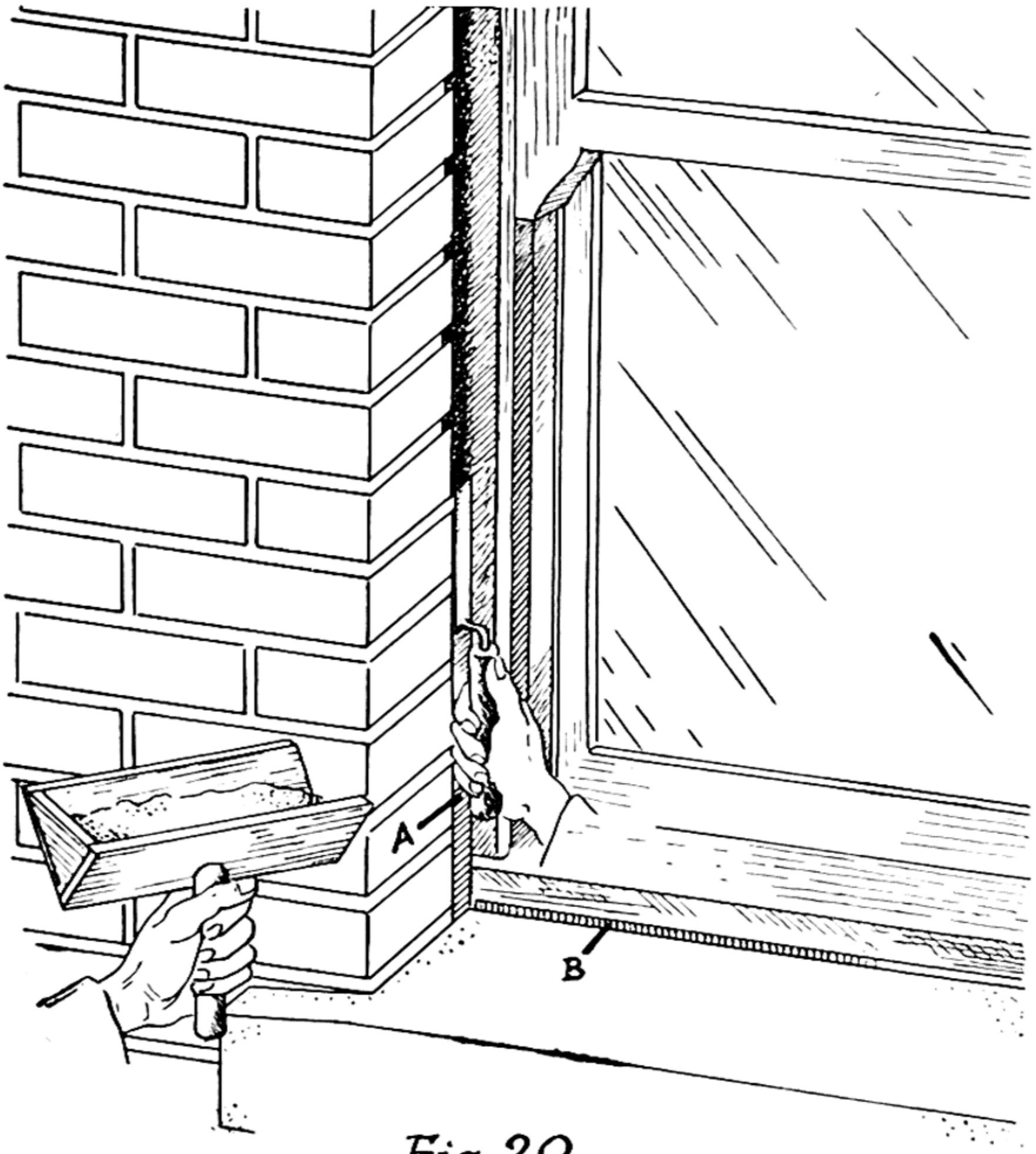


Fig. 20

Pointing around window-frame.

Note:- (A) mortar kept flush with brickwork, and (B) flush with vertical face of sill.

In repairs of this nature it is important to moisten the crack with linseed oil, after brushing away any dust and loose mortar. The mixed mastic is placed in a small hod and applied with a jointing trowel, forcing the material well into the opening to secure better adhesion (Fig. 20). It is better to avoid a broad bevelled finish; the repair will be neater and more easily painted if flush with the brickwork. When pointing the sill, finish off flush with the woodwork.

Old buildings are not so easily dealt with; the cavity is frequently so wide and deep as to require packing with strips of wood, prior to pointing. Needless to say, these strips must be firmly wedged and slightly countersunk to provide a grip for the mastic.

Where the defect is more than ½ inch in width, it is easier to make good with a mortar composed of one part Portland cement to three of sand: the defect to be thoroughly wet with clean water and an old brush before applying the cement. When set—in about an hour—the cement is lightly brushed with water to produce a smooth and level finish.

Wall Repairs

A mixture of cement and sand is frequently employed for the rendering (plastering) of external brick or stonework. A good mixture retains its waterproof properties for several years until, as a result of weathering and settlement or vibration, it slowly deteriorates, becoming increasingly porous, developing cracks, or falling away in patches.

With regard to the latter defect there is no doubt as to the superiority of Portland cement mortar for carrying out repairs. In the case of superficial cracking our choice of material is often limited because of the requirements of some later coating. On a painted surface, for instance,

it is wiser to employ oil mastic, Roman cement, Parian cement, or putty, in preference to Portland cement, unless the latter can be allowed several weeks in which to dry out.

Surface Cracks

Whatever the material employed, it is advisable to rake out all crevices with the edge of an old knife, until of sufficient depth to hold the stopping. If the base of the crack can be made wider than the surface, so much the better; it will ensure improved adhesion. In any case, the part must be thoroughly saturated with clean water, prior to the application of any form of cement, or coated with paint if mastic or putty is employed. Mastic is the stronger of the latter pair, and, because of its slightly rough texture, is often preferable to putty.

Large Areas

When a wall is plastered with cement mortar the work is usually executed as a three-coat job, and, to secure proper adhesion, each coating is applied whilst the surface beneath is hard, but still moist. Neither cement nor plaster can be expected to give a coating of maximum strength and tenacity if dried out too rapidly by application to a dry, porous surface.

The loosening of one or more of these coats indicates lack of adhesion between the parts concerned: the fault may be localised to one or two patches or may extend for several yards. There is, however, no point in stripping off more of the surrounding area than is absolutely necessary, even though this sounds hollow when tapped with the hammer. Providing that the work is reasonably hard, it is often possible to secure the edges and then repair the patch.

Providing Key

Where the brick or stonework is exposed, this provides an opportunity for hacking or raking out mortar from the joints, or, if too hard, for driving in some large clout nails—galvanised to prevent rusting—with the object of providing improved grip or key for the new material. A small pick, or a hammer and chisel, will enable joints to be opened to a depth of ½ to ¾ inch, which is sufficient for the purpose: at the same time, all isolated bits of mortar should be chipped away from the wall surface (Fig. 21).

Hair Mortar is undoubtedly the most tenacious and, if properly compounded, the strongest material for repair work. It is prepared from three parts of clean sand, one part Portland cement (bulk measurement) and about 2 per cent. of hair: the latter may be cow, hog, goat, or other animal product. The whole is mixed to a stiff consistency with water, and it will be found that the addition of hair holds the mortar together and enables a thicker coating to be applied: a matter of particular importance when first coating.

Immediately before the application of mortar it is absolutely essential to saturate the brickwork with clean water: every part, including open joints and the edges of the patch, must receive a liberal wash or spray to remove dust and check excessive suction. The edges may then be plastered, leaving a bevelled edge, the rougher the better.

Plastering

By the following day the edges should be hard, and firmly attached to the wall. The whole patch is again saturated, and plastered with hair mortar, the total thickness being about ¼ inch below the level of the sur-

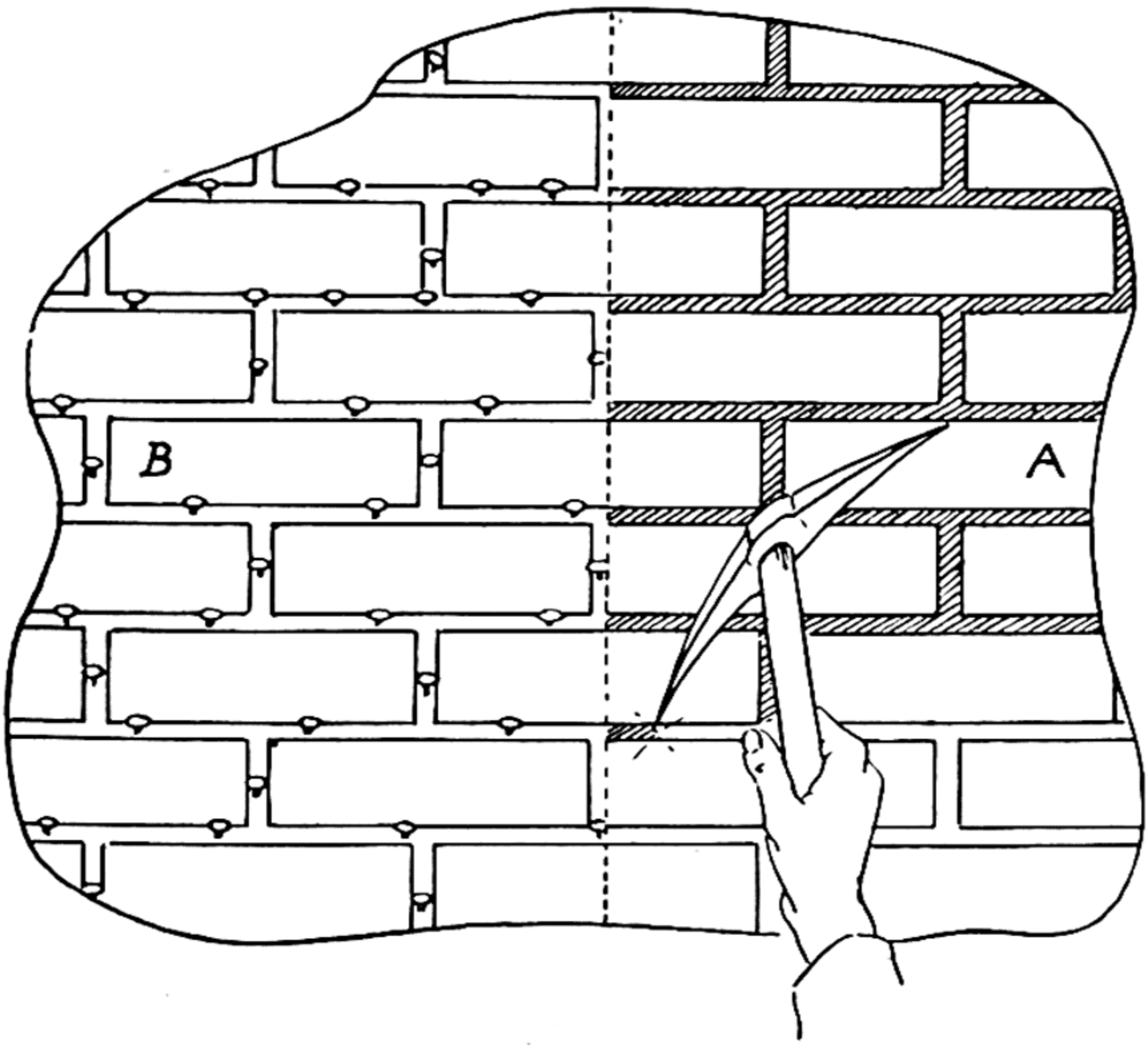


Fig. 21
Making a key for new plaster.

by
(A) *Picking out the old mortar;*
(B) *by means of clout nails.*

rounding surface. The treatment of very large areas is facilitated by the use of a laying trowel, or home-made substitute (Fig. 22); this rectangular trowel has a blade of about 10 inches by 5 inches and, by trowelling in varying directions, gives a perfectly level surface. After an hour or so the work will be "set" and should then be scratched in a criss-cross fashion to provide key for the final coat. Finally, use an old brush and clean water to remove any mortar from the surrounding surface.

It is advisable to allow at least twelve hours before putting on the finishing coat. If the preliminary plastering is still damp, there is no need for further wetting, but if dry—as in the surface coating of old work—porosity must be checked as before. The mortar for this coat can be prepared as already mentioned, but without the addition of hair.

Cleanliness is important in plastering as in painting. The surface on which the cement is mixed, together with the handboard and other tools, should always be rinsed clean after using. The presence of grit, and what is even worse, of earth, is undesirable and frequently causes blistering of the finished work.

Stucco Finishes are in general use for exterior work, while the smooth finish is mainly used upon interior walls. In both cases the mortar is identical, the type of surface being decided by the trowel used, or by combing or spattering the newly plastered work. A level surface provides the necessary foundation, and to obtain this by the simplest method requires a straight-edge or piece of match-boarding about 1 foot longer than the patch. This is used to test the surface during the application of a final coat; it shows up any hollow places and, when these are filled, it is used to scrape off any surplus (Fig. 23).

The final trowelling is carried out within an hour or two, using a steel trowel if a smooth finish is desired, or a

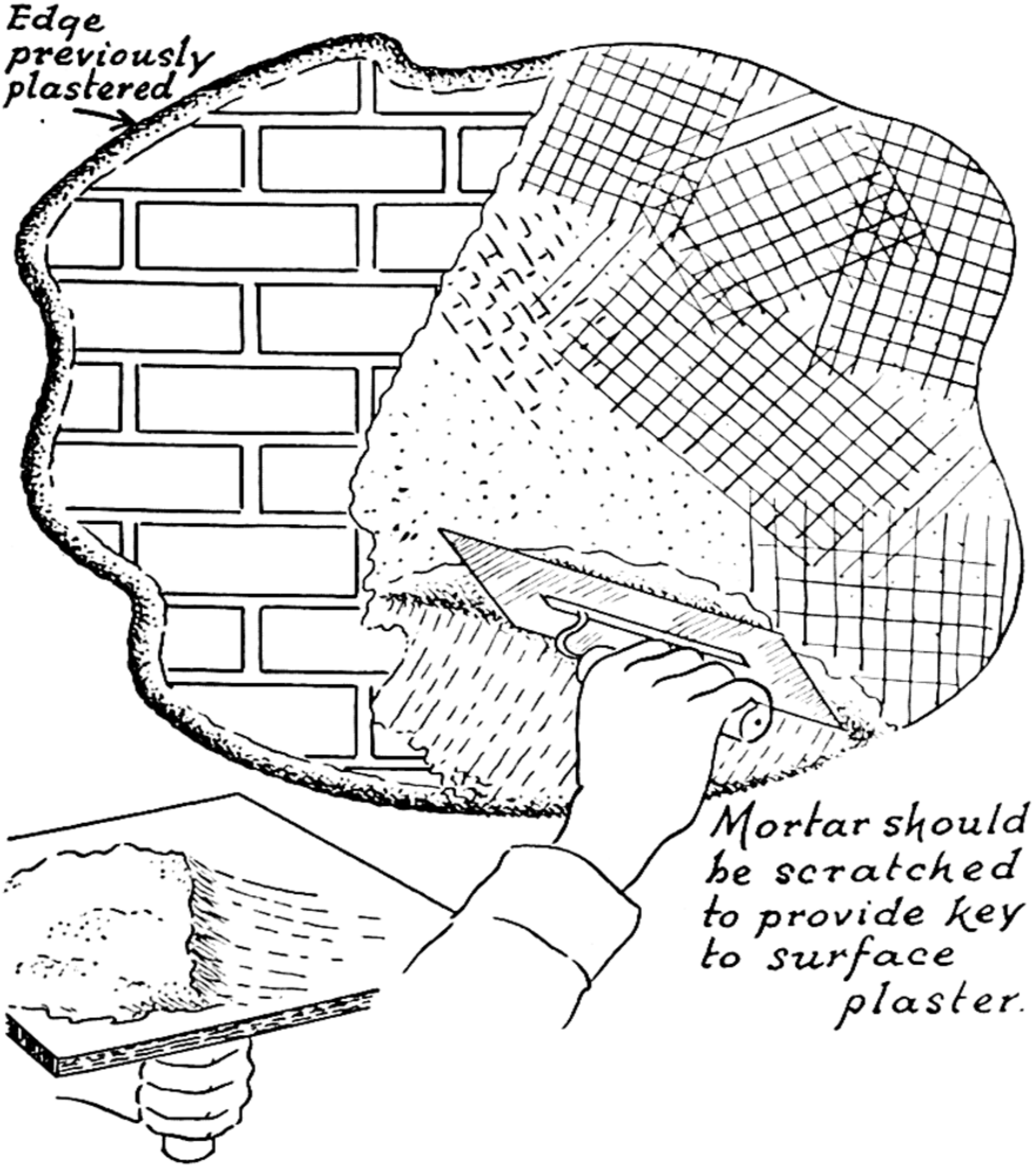


Fig. 22

Plastering with laying trowel.

wooden float if the surface is to remain as rough stucco. Throughout this operation the surface is frequently coated with water, applied with an old distemper brush. Pattern may be introduced by the use of a coarse comb or an

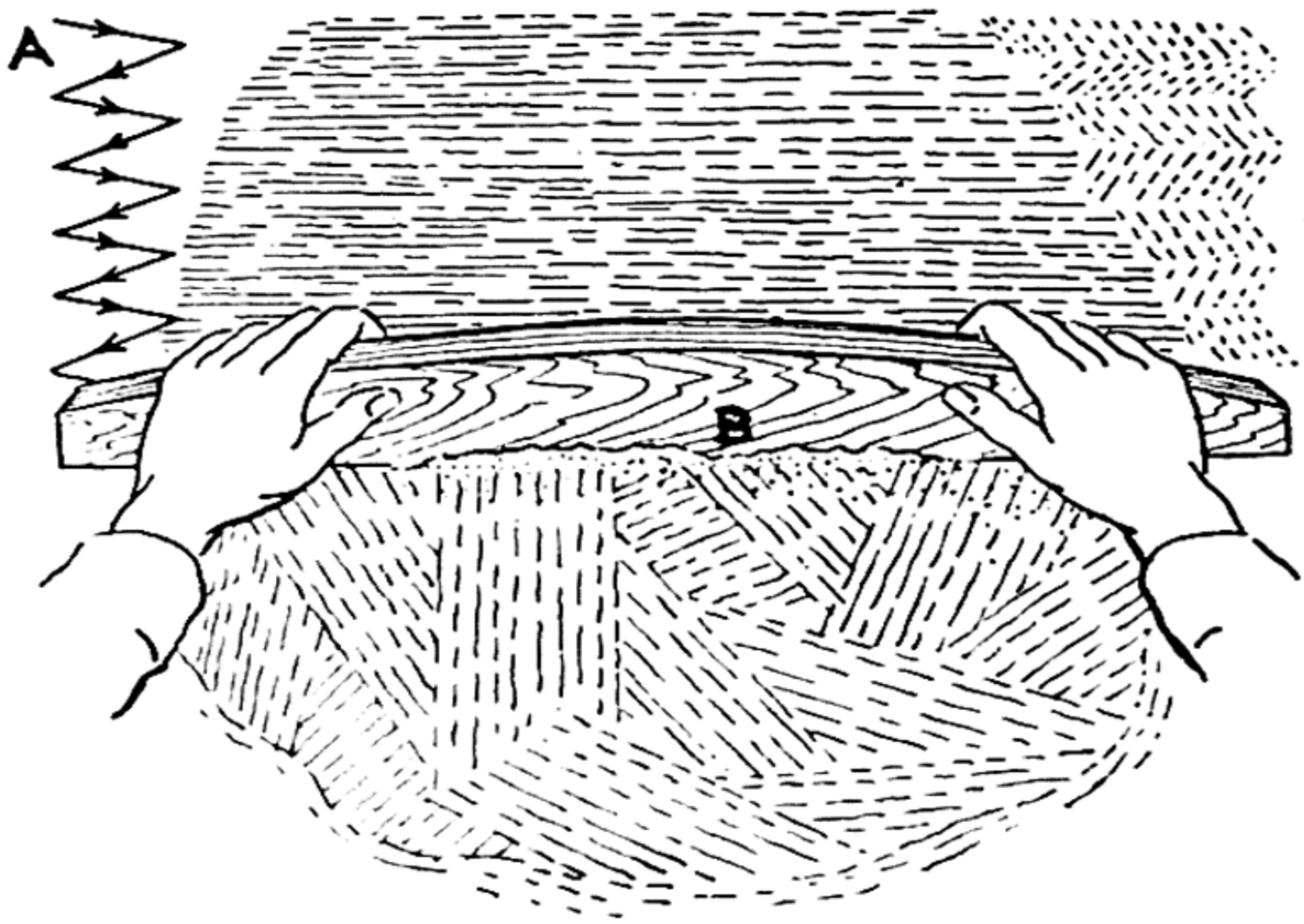


Fig 23

Levelling a repair executed in cement mortar. A straight edge is dragged across the surface in zig-zag fashion (A) to scrape off surplus cement (B).

effect of masonry obtained by marking out the appropriate lines with a 6-inch nail (Fig. 24).

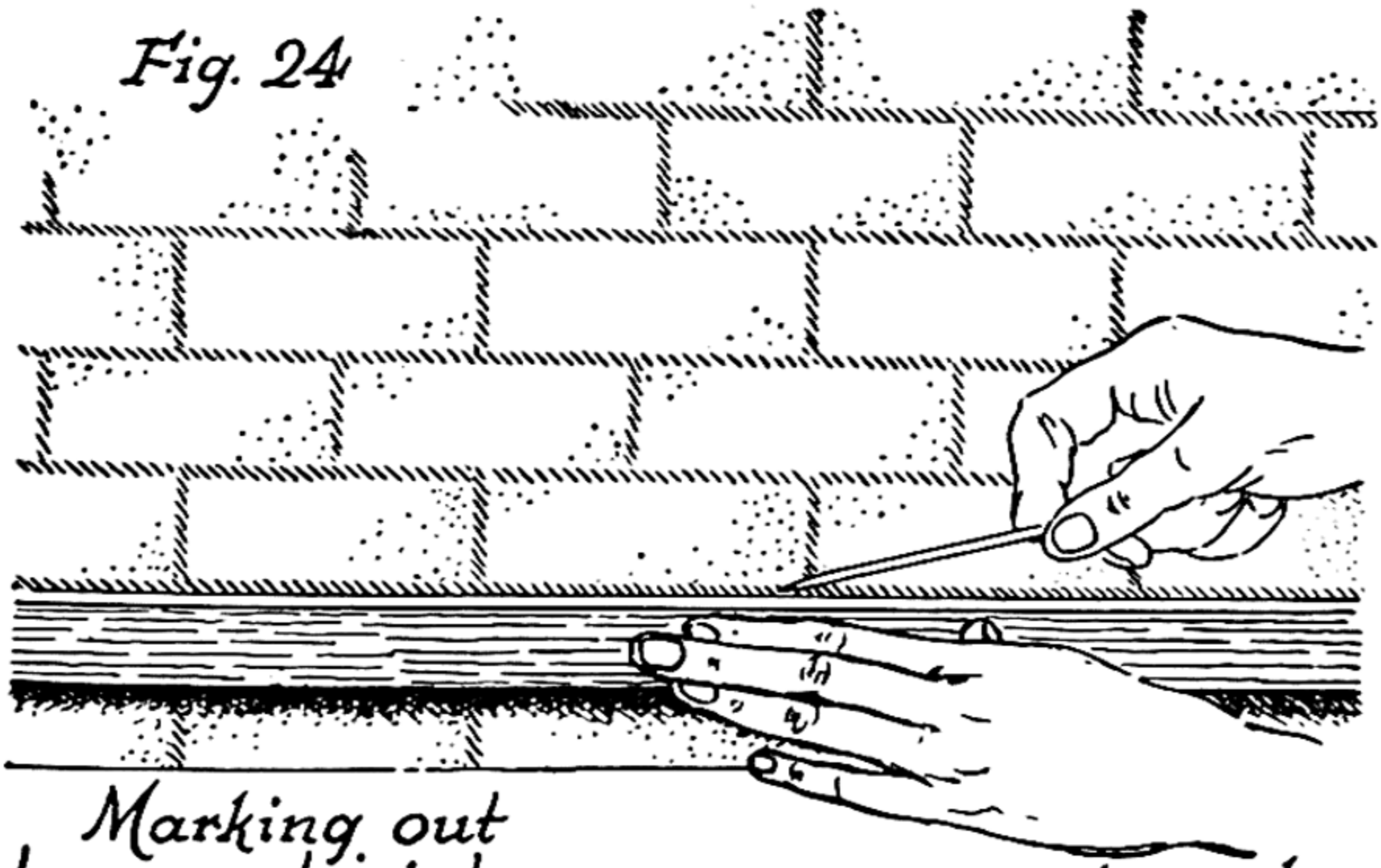
Pebble-Dash Finishes

Apart from their decorative value these finishes assist in keeping a building waterproof; furthermore, they are almost unaffected by weathering, and retain their original brightness of colour for many years. When repairs become necessary, the most difficult job is to secure

gravel matching the general colouring and size of the pebbles used. The best procedure is to take several broken pieces (complete with pebbles), visiting one or more of your local builders or plasterers until the sample is matched.

The actual repair necessitates a two-coat job, as already

Fig. 24



Marking out to suggest joints upon new cement work.

described, but with this difference. The first coating should be rather thinner, in order that the surface coat may be of sufficient thickness or depth to hold the pebbles securely. The latter should be thrown at the freshly applied cement with enough force to ensure adhesion.

The Pointing of Brick and Stonework

This may be defined as the act of filling the joints or crevices of a wall with mortar. The presence of such defects is responsible for much of the dampness which penetrates and discolours internal wall surfaces. Pointing

is also advisable in those cases where the original mortar has, by the combined action of rain and frost, disintegrated into a soft, powdery mass. The latter state can often be prevented, or delayed indefinitely, by painting or oiling the joints at regular intervals, thus maintaining a hard, waterproof surface.

What type of mortar to use will depend upon the extent of the work: if, for example, the job consists of isolated patches, these should be made to harmonise with the surrounding surface. On the other hand, if the whole wall requires pointing, one can choose any of the following: (*a*) Portland cement, one part to three of sand; (*b*) one part cement to four of black mortar; (*c*) red mastic mixed with boiled linseed oil, or (*d*) grey mastic with boiled oil. The cement mortars are considerably cheaper and are therefore suitable for work involving large or deep joints. Mastic gives a cleaner and neater finish; the red variety matching the general colouring of brickwork, the grey mastic being particularly suitable for stonework.

Preliminary work consists of raking or chipping out the old mortar to a depth of ½ inch to form a key for the new material (see Fig. 21). Follow by brushing away all dust and then by saturating the joints, using water as a preparation for cement mortar, but using refined linseed oil if the work is to be finished in mastic. Linseed oil should not be allowed to stain the face of brick or stonework during this operation, and, if the joints are narrow, it requires the skilful use of a small brush to do the job neatly. An ideal tool can be made by cutting down an old paint brush to the desired thickness (Fig. 25A).

In the actual pointing operation the mortar (or mastic) is pressed firmly into each joint until flush with the brickwork. A ½-inch jointing trowel is the best tool for the job; it picks up just the right amount of material and enables joints to be filled without encroaching upon

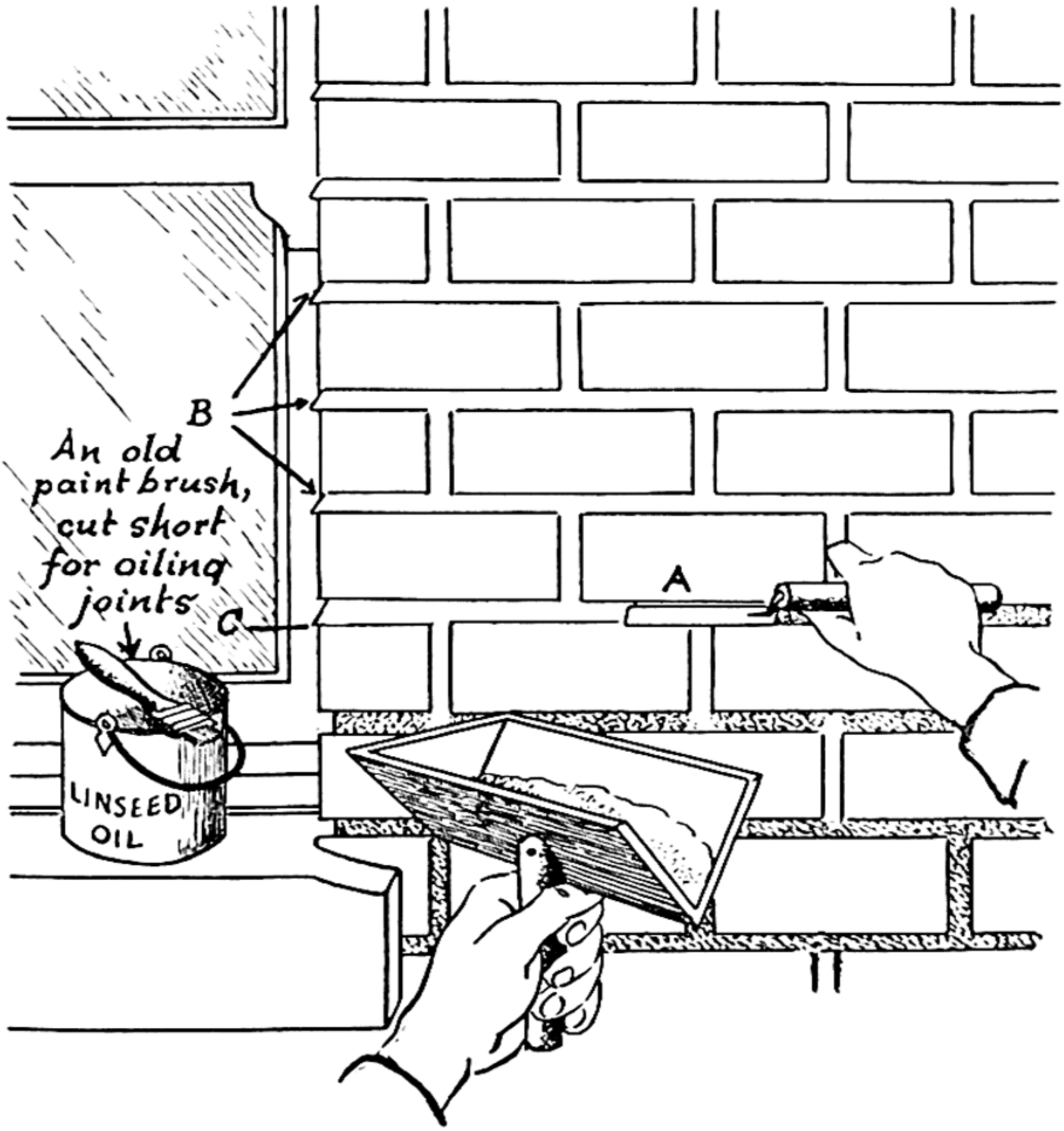


Fig. 25

(A) Mastic pointing.

The weathered (sloping) joints (B) help to turn rainwater. Note the projecting edge (C).

the face of brickwork. The work is facilitated by filling the vertical joints before the horizontals; the latter are generally finished with a slight bevel (Fig. 25B and C); the slight projection at the bottom edge is cut straight and square with the trowel.

Waterproofing Compounds

These may be used upon cement stucco, brickwork, or stonework, with the object of preserving and waterproofing the fabric. The majority are proprietary goods supplied ready for use: some are transparent, others semi-transparent, and quite a number are available in paint form. The question of colour is of particular importance where brick and stonework are concerned; any compound which darkens with age can spoil the natural beauty of stonework and, to a lesser extent, of brickwork. This rules out those materials containing linseed or other drying oils which oxidise and discolour; other compounds dry with a gloss which is anything but pleasing to the eye. It is wise therefore to ascertain the precise colour and finish when purchasing.

Cement stucco can be waterproofed by coating with "petrifying liquid," an oil emulsion supplied in a ready-for-use form, by makers of oil-bound distemper. The surface will require two coats; the first checks porosity and enables a second coat to be brushed on with comparative ease. This forms a good and economical base for any further treatment in either oil-bound distemper or oil paint—"outside" quality being essential.

Bituminous compounds are available in three forms: (*a*) as washable distemper; (*b*) coloured compositions, similar to oil paint, and (*c*) as black tar-like paint. Cement and old brickwork can be preserved and decorated by (*a*) or (*b*), but (*c*) is particularly valuable for the treatment of flat roofs and for basement or other walls

in contact with soil. Even common gas tar may be thinned with paraffin, for use in these situations.

Glazing

The replacement of cracked or broken windows is a minor repair to be dealt with before commencing any general preparation of the paintwork. If glass is available for immediate cutting, all the old putty should be hacked out (Fig. 26A), brads extracted (Fig. 26B), and the broken glass carefully removed. There will now remain another and thinner layer of putty (Fig. 26C) in which the old pane was embedded: this, too, must be chipped out and scraped with a knife until the woodwork is quite free from hard lumps which might break the new glass. The rebate should now be coated with oil paint thinned with turpentine or its substitute, white spirit.

Glass may have to be obtained from a local dealer, in which case it is only necessary to hack out sufficient putty to enable correct measurements to be taken (Fig. 27). There is no point in removing an old pane before new material is available for immediate use. When measuring, some allowance must be made for putty in which to bed the new glass: if we allow $\frac{1}{8}$ inch for small panes and $\frac{3}{16}$ inch for large ones, there should be no difficulty when fixing. Putty will be required in the proportion of approximately 1 lb. to each 2 feet 6 inches by 1 foot 6 inches square of glass.

Glass Cutting

The essentials for this job are a perfectly flat bench or table, clean glass, straight-edge, cutting wheel, and 2-foot rule. A tee-square is a great help in squaring the glass, but an efficient alternative is obtained by drawing a large right angle upon white paper and placing this beneath the glass as a guide (Fig. 28). Arrange the glass so that

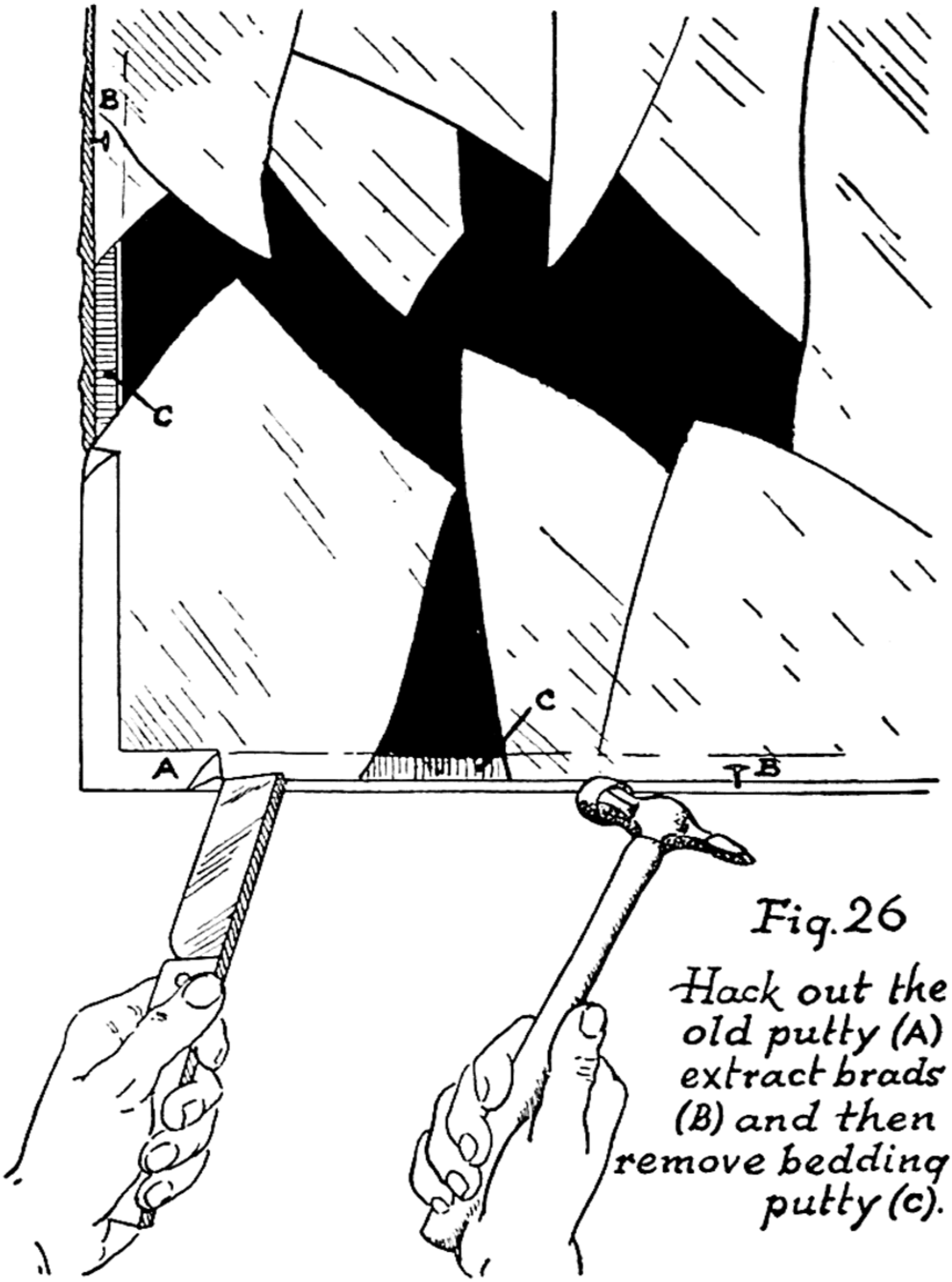


Fig. 26

Hack out the old putty (A) extract brads (B) and then remove bedding putty (C).

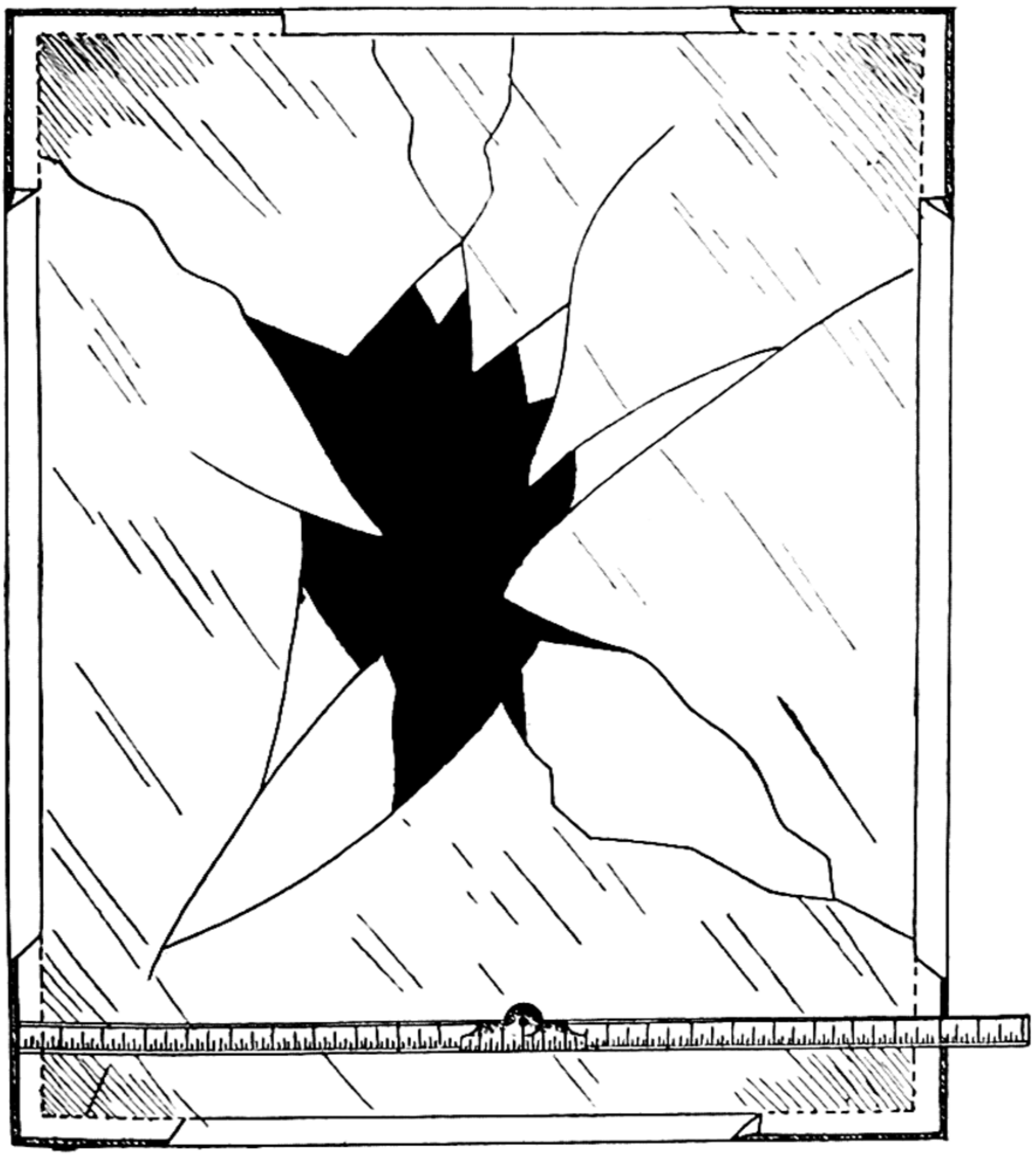


Fig. 27

When measuring for a new pane allow at least $\frac{1}{8}$ in. for bedding putty.

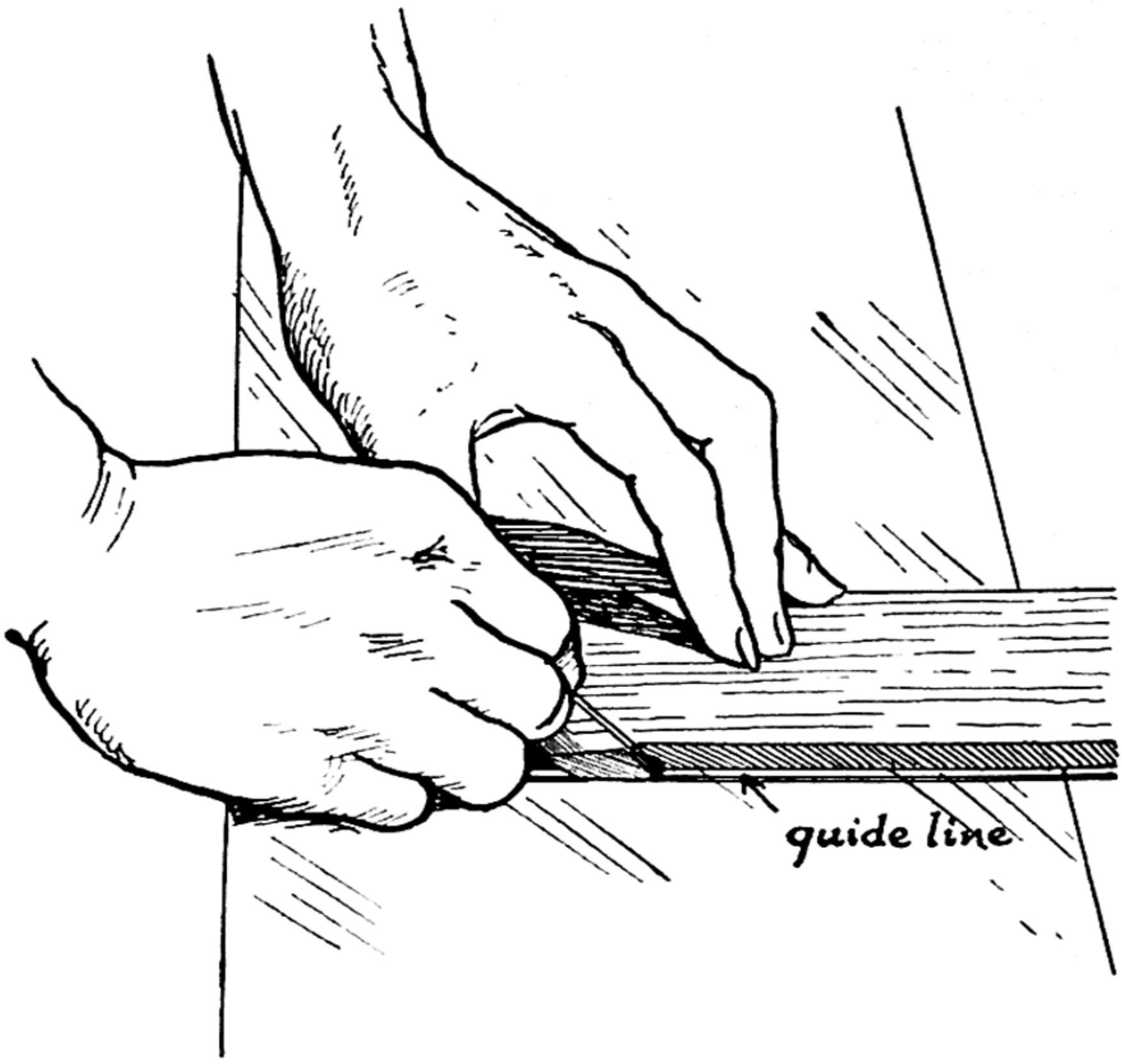


Fig. 28

Cutting a pane of glass.

Note the guide line forming a right-angle with the front edge of the paper.

the line to be cut is exactly over the line drawn across the paper, the adjoining edge to form part of the right angle.

In cutting the glass, an allowance must be made for the half width of the cutting wheel: this means holding the straight-edge approximately $\frac{1}{10}$ inch to the left of the line. The cutting is done slowly and with sufficient

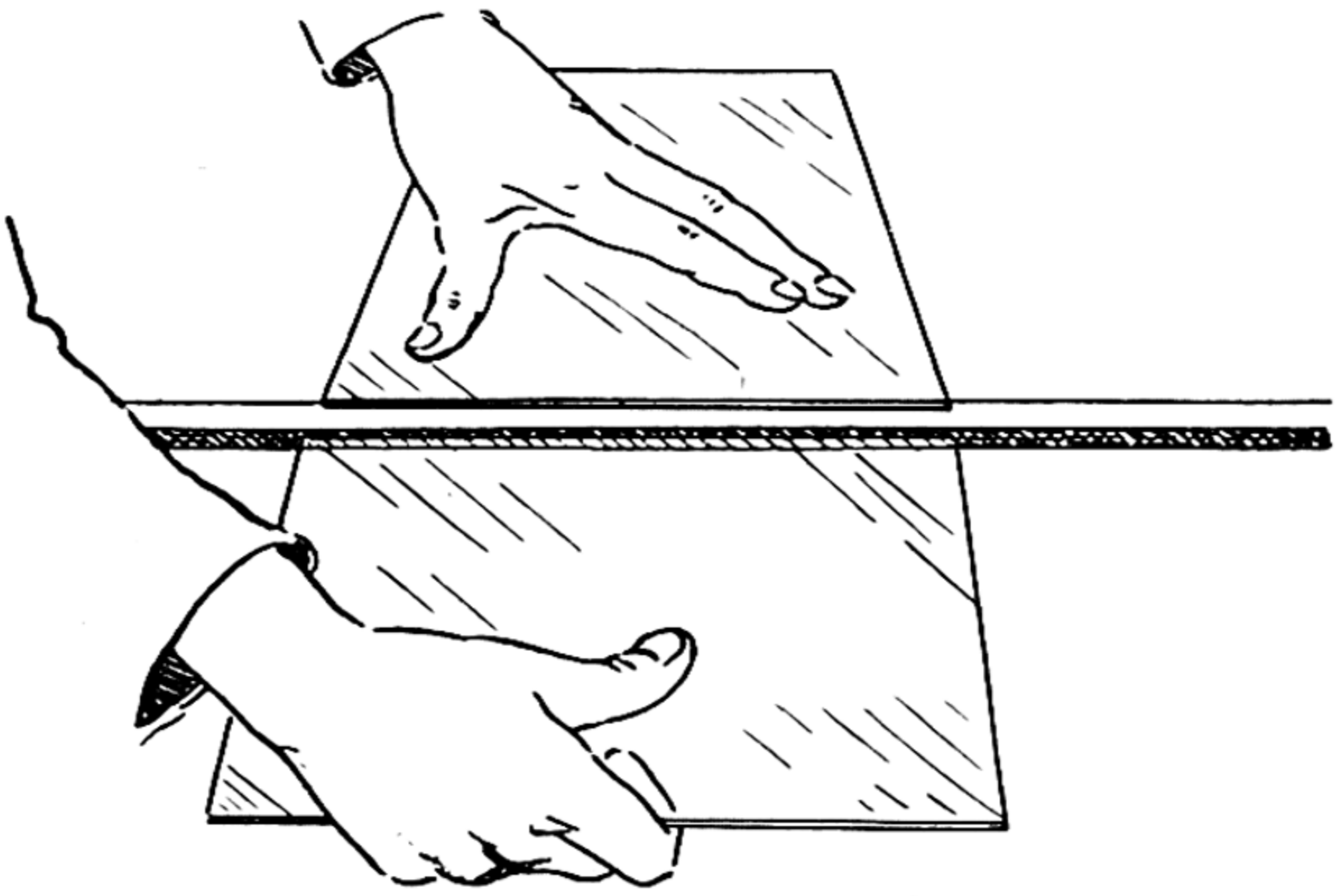


Fig 29 Removing surplus glass

weight to obtain continuity of line (Fig. 28); if the wheel tends to skid, this indicates either lack of pressure or the presence of dirt or grease. Glass varies considerably in the qualities of hardness and polish; it becomes increasingly brittle as a result of exposure to weather, and is more difficult to cut. It is sometimes helpful, when dealing with hard or highly polished glass, to dip the wheel into white spirit immediately before use.

The removal of surplus glass is best accomplished by the method shown in Fig. 29. The glass is placed with

the cut line about $\frac{1}{16}$ inch beyond the square edge of the bench; the pane is held firmly with the left hand, and waste is smartly snapped off with the right hand. Any jagged pieces can be nibbled off with pliers. Because of the risk of minute splinters, it is advisable to wear glasses or goggles throughout the operation.

Glazing should present no difficulties if the newly cut pane is easy fitting. The glass should be tested for size before any putty is used; it may be that the frame, or glass, is slightly out of square, and a trial at this stage will quickly show how best to use the pane. Sometimes a square of glass may have to be reversed or even turned upside down to obtain the best fit; in such cases the glass can be marked with chalk or soap to simplify its refitting.

To ensure a watertight job, the glass must be embedded into a thin layer of soft putty. For this purpose, the required amount of putty may be softened by the addition of a few drops of linseed oil or, alternatively, by warming and kneading in the hands; it only requires an application of about $\frac{1}{8}$ inch in depth, but it should cover the bed of the rebate (Fig. 30A) before refitting the glass.

A cloth pad may be used to press the glass firmly into position, and if this is continued in a clockwise direction around the edges, it will be possible to see the air pockets gradually disappearing. The pane is held in position by a few tacks (Fig. 31A); these are kept slightly away from the glass and are carefully driven home with a light hammer slid across the face of the glass. The job is completed by puttying the edges and finishing with a smooth, bevelled surface (Fig. 31B).

Leaded Lights can be repaired with success by the amateur, providing that the broken panes are interspaced by sound ones. In carrying out such replacements we cannot complete the work in a truly professional manner, *i.e.*, by soldering, but we can produce a watertight and

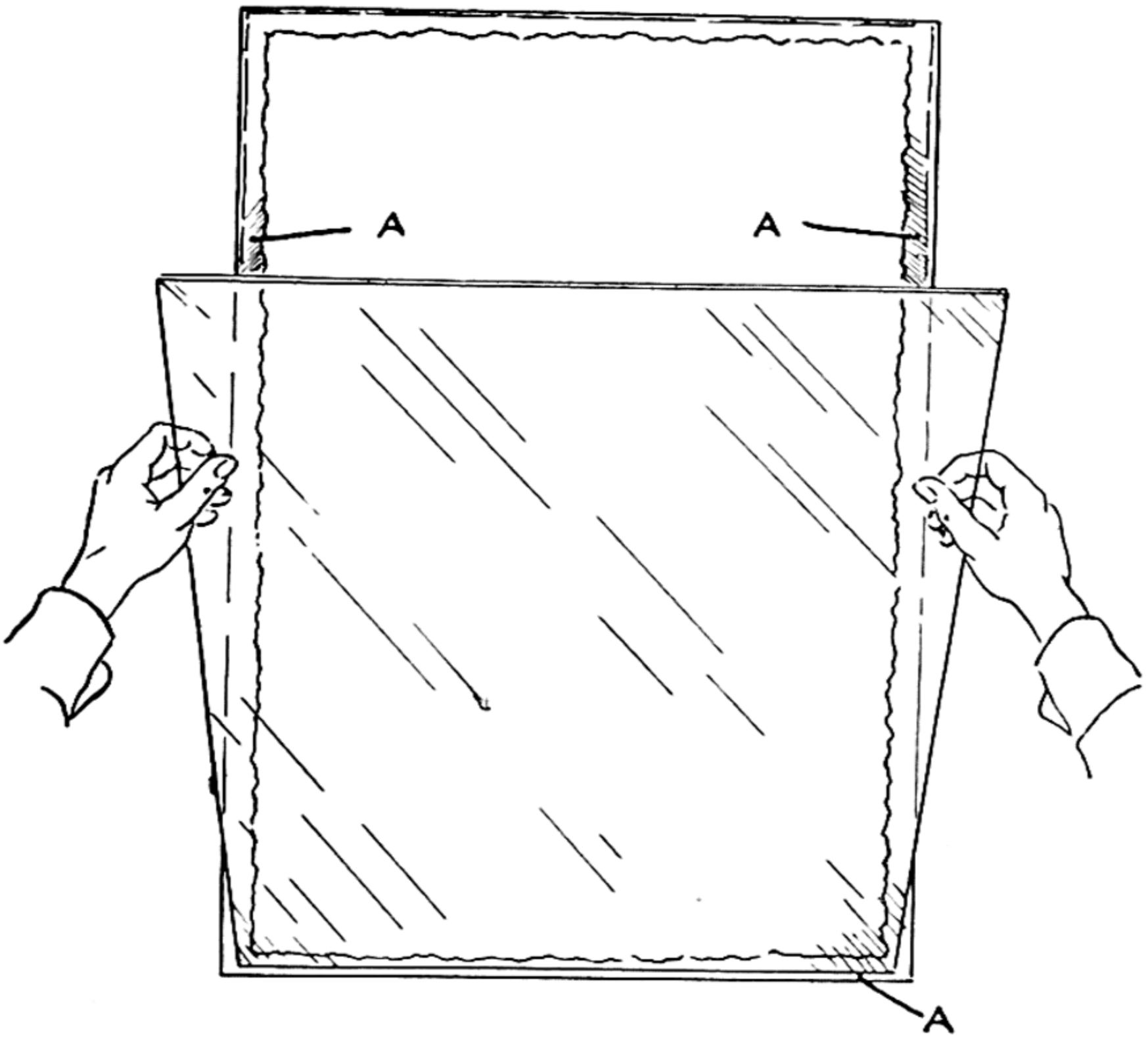


Fig. 30

Fixing the pane (bottom edge first):

(A) indicates the bedding putty.

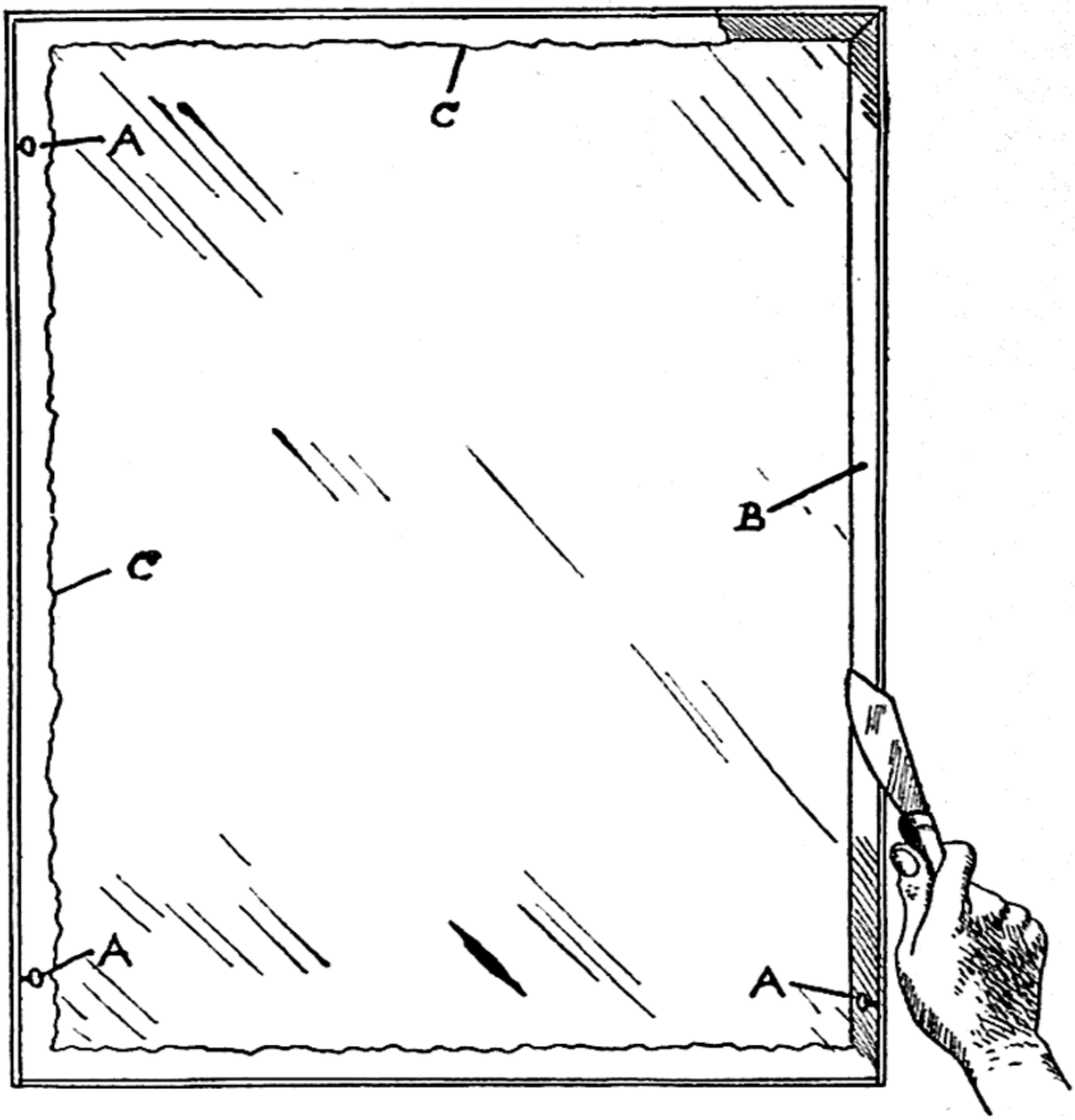


Fig. 31

The glass is held firmly by a few tacks (A), and the edges are puttied and left smooth (B). Finally, the rough internal edges (C) are trimmed off.

almost invisible repair with the aid of white lead, a little dry black, and some gold-size.

The work is done from the inside, commencing by cutting the four corners of the lead surrounding one of the broken squares. It requires several cuts with a stout knife to sever the inside strips, but the outside ones are left untouched. The lead is lifted with the aid of a 1-inch chisel knife and curled back on three sides, the fourth can be opened slightly to facilitate measurement and fixing.

The glass must be cut to allow about $\frac{1}{12}$ inch at the top and at one edge; try this to secure the best fitting, and then remove before puttying. The putty for this job is a mixture of white lead and gold-size—or outside varnish—coloured with dry black (or soot) until of a lead colour. It can be mixed with an old knife, upon a clean board, until the consistency approaches that of a soft, sticky putty: a little whiting, chalk, or fine plaster (not Portland cement) may be added to stiffen the composition.

Glazing is carried out in the usual manner—*i.e.*, by puttying the rebate, fixing the pane, and then pressing the lead back into its original position. Only a small amount of putty is employed, and as this serves as a waterproof cement, it must be applied to every part in contact with the glass. The lead strips are finally smoothed and polished by rubbing with an old spoon: surplus putty being cleaned off with an old rag.

Colouring or Tinting the Glass should only be attempted by those capable of matching the existing colours. We would, however, suggest a method of procedure most suitable for the job, and which, under ordinary conditions, will last for some years.

Since glass is smooth and non-porous, we must employ the most tenacious form of paint—*i.e.*, varnish paint. It requires very little material—1 pint is enough for 8 square

yards—but the varnish must be of the best quality, pale in colour, and capable of withstanding outdoor conditions: a good elastic carriage varnish is ideal. A little varnish is slightly tinted with oil colour or oil paint, until of the correct strength; this is applied to the glass and stippled (dabbed lightly with the tip of the brush) to remove streaks and distribute the colour evenly.

The actual time for treating one pane should occupy only a few minutes, and, if this is completed within ten minutes, it will be found that all the stipple marks will rapidly disappear, leaving the work quite clear and transparent. When dry, or, better still, in two or three days' time, the work may be given the additional protection of a coat of untinted varnish.

The Treatment of Old Paintwork

Whatever the type of surface to be painted, some preliminary work is usually necessary. The nature and condition of various materials and surfaces call for widely varied treatment, but fortunately there is an adequate number of very definite cases, each associated with a specific form of treatment which, if properly grasped, will indicate the best procedure for any new set of conditions.

In exterior painting we find the condition of old paintwork particularly bad. The destructive effects of weathering may have a more damaging influence in four years than would be possible in twenty years of normal wear indoors. Outside painting is intended primarily as a means of preserving perishable materials, such as wood and ironwork, and, if this is to prove really economical, re-painting at regular intervals is necessary.

It is better to apply one coat of paint every two years than to give two coats every four years. The more frequent painting provides an opportunity for the filling of cracks, and thereby keeps the fabric waterproof. The

work is maintained in better condition, and preparation is reduced to the minimum.

The Objects of Preparation are twofold: (*a*) to produce a surface which will ensure maximum adhesion and normal drying of the new paint, and (*b*) to secure a firm, stable, and, if possible, a smooth foundation.

(*a*) The conditions essential for perfect adhesion and drying are: absolute cleanliness and dryness. Surfaces in reasonably good condition should be washed down with soap and water, and then rinsed with clean water: this removes dirt which would otherwise interfere with normal drying and adhesion of the new paint. For the same reason the presence of moisture is equally objectionable; furthermore, the painting of damp surfaces is a frequent cause of blistering.

(*b*) Old paintwork may present an unstable surface —*i.e.*, it may be soft and tacky, badly blistered, or flaking off. In such cases it is better to remove all the old paint and start from a solid basis—the bare wood. In other cases the paint may exhibit fine cracks, or present a rough, or powdery, surface and yet be hard and firm. In these circumstances it is usual to rub down with pumice stone, or other abrasive, using water as a lubricant until a smooth foundation is obtained.

There are, of course, awkward situations where these methods may prove impracticable. On gutters and barge-boards, for example, it is quicker, easier, and less risky to adopt the more straightforward method of scraping and then sweeping down with a jamb duster.

Washing Down does not involve any laborious scrubbing. We employ a hot solution of washing soda, using about ¼ lb. of soda to 1 gallon of water, or, as an alternative, we may use one of the varieties of "sugar soap." The latter is obtainable from builders' merchants and has detailed instructions on the packet. We shall require a

separate bucket containing clean water for rinsing, and two brushes, one for washing and one for rinsing. For brushes, we can use almost any type, providing that they are clean, but old distemper or paint brushes are preferable.

In washing down, we rely mainly upon the solvent action of the soda rather than upon scrubbing. The solution is applied freely and allowed about ten minutes in which to penetrate. It is then removed by a thorough wash down with clean water, and horizontal ledges are dried with a clean swab or mop. This simple type of preparation may dry out with a patchy appearance, but it achieves the object of removing dirt and grease and, of equal importance, it removes a little of the old paint and thereby provides better key or grip for the new paint.

Rubbing Down is a convenient process which cleans and levels a surface at one operation. It is interesting to note that Statutory Regulations, imposed in 1926, contain a clause prohibiting the dry glass-papering of painted surfaces. This ruling, which concerned lead paints only, has since been applied to all types of oil paint; the object being to prevent the formation and inhalation of poisonous dust by the operative painter. Apart from the hygienic aspect we must accept the fact that wet rubbing down, whether by waterproof glass-paper or other means, is considerably more effective than dry glass-papering.

Waterproof glass-paper may be used upon wet surfaces during the preliminary washing down of old work. It has certain advantages over pumice stone—*e.g.*, its superiority for mouldings, freedom from grit, and general usefulness at any and every stage of a job. There are numerous grades, ranging from very coarse to very fine; the medium grade (No. 2) is suitable for preliminary work and No. 1 grade for the smoothing of intermediate coats of paint.

Pumice stone is cheap and effective, but is limited to preliminary smoothing processes. This material varies in quality, the best type being comparatively soft, light in weight, and with open grain or pores. It is prepared for use by cutting across the grain with an old saw, and then by rubbing upon a smooth, wet stone to produce a smooth face (Fig. 32). By cutting each block into a rectangular shape we are better able to rub down the more awkward parts, such as the corners of panels.

Pumice stone is employed during the operation of

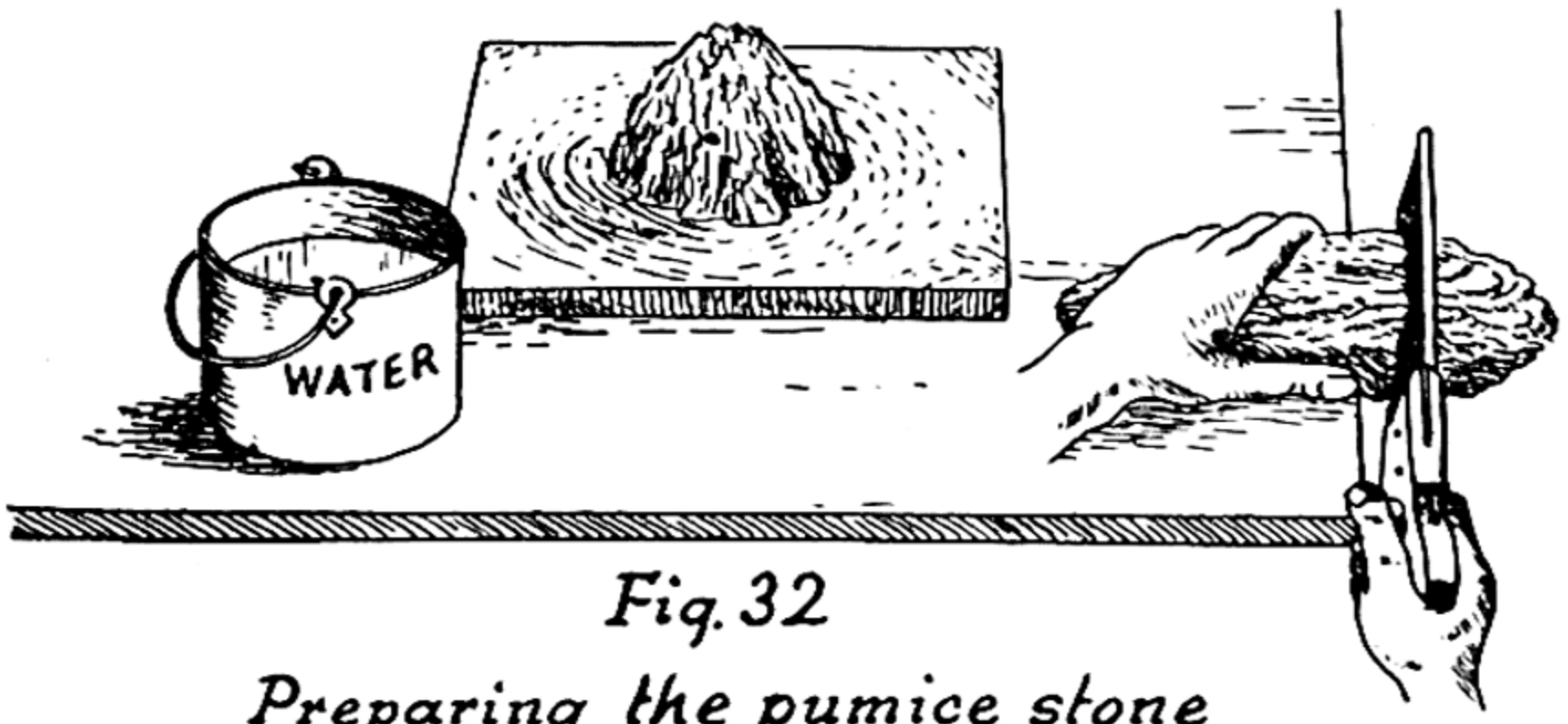


Fig. 32

Preparing the pumice stone

washing down. Its action is partly abrasive and partly a cutting operation, and it matters little whether the direction followed is circular or straight. It is important to keep the paintwork wet and free from specks of grit which are certain to break off the edges of the abrasive. If the pumice stone becomes choked with paint, it must be rubbed upon the wet stone until a new face is produced. When the paintwork is smooth and level it only requires a final wash down with clean water.

Patent pumice blocks are available in coarse, medium, and fine grades, the latter being preferable for general work. These are rectangular blocks prepared from

finely ground pumice powder mixed with a suitable binding material and then cast into moulds. In some cases a percentage of soda is included; the object being to assist paint removal by solvent, as well as abrasive action: "Strippabloc" is a popular and widely used material of this class (Fig. 33).

The advantages of these so-called soda blocks are most apparent when rubbing down surfaces of a glossy or tacky nature. Ordinary pumice stone is inclined to slide over these surfaces and is consequently slow in its abrasive action. Each is particularly effective in its proper sphere; pumice stone being employed upon dull and semi-gloss paints, and soda block upon varnished or glossy surfaces. The latter abrasive is soluble in water and, if allowed to remain upon paintwork, may eat through several coats and produce an unsightly hollow place. Care must always be taken when finally rinsing down, to see that no trace of soda is left behind: the presence of alkaline matter is injurious to superimposed paint.

In the rubbing down of doors, gates, and window-frames, we employ pumice stone or blocks of suitable size, attending first to the flat areas and afterwards finishing any curved parts with waterproof glass-paper. The complete removal of painted lettering upon gates must also receive special attention, unless we desire the shapes to be seen through the new paint as a guide for re-lettering.

Removal of Paint and Varnish

In this instance we are concerned with the complete removal, and not, as hitherto, the partial removal of paint. As a general rule we strip off any paintwork which is blistered, badly cracked, overloaded, excessively soft, tacky, or peeling off. In other words, we adopt this procedure in all cases where it is quicker to remove the

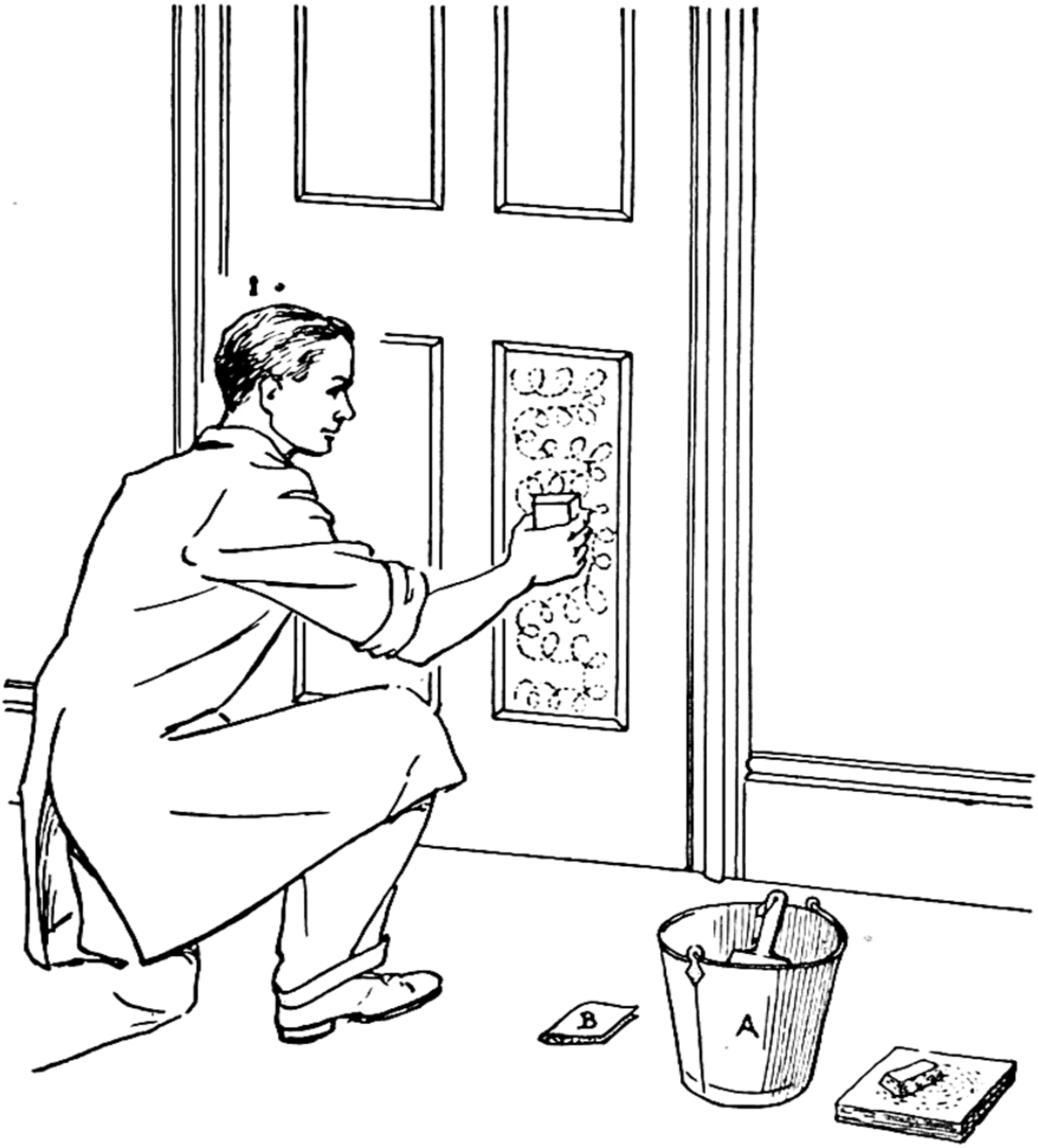


Fig. 33

Rubbing down with pumice block.

(A) Dilute solution of sugar soap.

(B) Waterproof glasspaper for mouldings.

whole paint, than to produce a satisfactory surface by rubbing down. We must not forget, when making a decision, that by getting down to the bare woodwork we shall probably find a rougher surface and one requiring more coats of paint than a surface obtained by rubbing down. There is, however, some satisfaction to be gained from doing a job thoroughly.

Paint removal may be accomplished by several methods, each of which possesses definite advantages and shortcomings. We shall, in the following paragraphs, consider the pros and cons of: (1) Burning off; (2) Spirit, and, (3) Caustic, paint and varnish removers.

(1) *Burning Off.*

This method is clean, speedy and, if properly carried out, leaves a surface which requires only slight preparation prior to painting. There are, however, certain limitations: one cannot apply heat upon or near glass; heat causes warping of thin sheet metal; it scorches woodwork—an obvious disadvantage when stripping varnish from oak gates, etc. Heat is also unsuitable for the removal of cellulose paint or lacquer; those capable of softening would be highly inflammable.

In burning off a door or other surface containing mouldings, we require a shave-hook, broad scraper, chisel knife, and, of course, a blow-lamp, complete with fuel and accessories. In the absence of a blow-lamp, we have, on more than one occasion, used a large Bunsen burner, with a length of garden hose attached to a convenient gas point. The heat produced is remarkably efficient for the purpose. A step-ladder will also be necessary and (if we are to avoid the formation of dust) an old bucket containing a little water.

It is better to commence with the most difficult part —the mouldings. These require care and patience, and

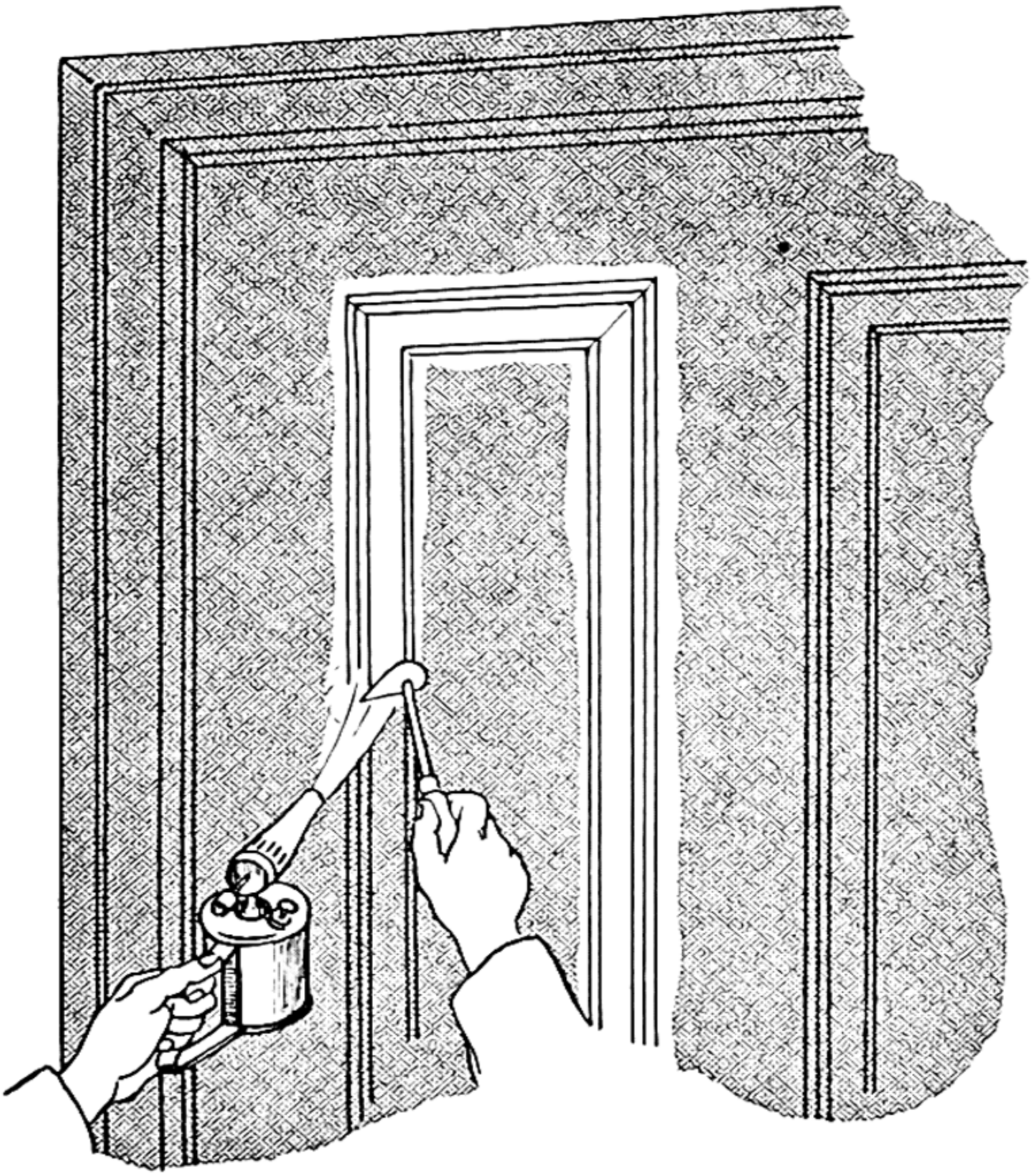


Fig. 34

Mouldings should be completed before burning off the flat areas.

will, in the case of an ordinary four-panelled door, keep one busy for two hours. The term "burning off" must not be misunderstood; we employ heat to soften the paint, and immediately this occurs, the flame is removed, and the paint scraped off. With care, it is possible to strip off the paint without charring the wood beneath. There is no point in softening too great an area, for this has the effect of stoving or baking the paint and rendering it more difficult to remove.

Mouldings are dealt with in short lengths of from 9 to 12 inches, the flame being kept on the move, backwards and forwards, until the paint can be cleaned off with a shave-hook (Fig. 34). It usually requires several attempts to clean out the quirks and angles, and leave the surface smooth. During this operation, almost every part of the shave-hook is brought into play: the "point" cleans out awkward angles, the "flat edge" attends to convex curves, and the "round end" cleans out any concave mouldings. The whole job calls for very little pressure, otherwise the sharp edges of a shave-hook might well destroy the original shapes of mouldings. A chisel knife is usefully employed upon the outer edges of mouldings and also for cleaning the shave-hook.

Panels and other flat areas offer little difficulty; these can all be stripped clean in about half an hour. Here, the technique is rather different; the blow-lamp is moved slowly and continuously in the direction of the wood grain, meanwhile, a 2½-inch scraper follows immediately behind and strips off the whole thickness. After a time, the work becomes almost mechanical, the speed of the scraper dictates the speed of the flame and the movement of both is synchronised. The old paint may be dropped into a bucket or, if desired, the bucket may be placed beneath the ladder, to catch the molten paint which falls from continuous cleaning of the scraper (Fig. 35A).



Fig. 35 (A)

Cleaning the scraper in this manner prevents molten paint from dropping (and sticking) upon the floor.

Again, it is necessary to repeat the same operation three or more times, until the woodwork is quite smooth and entirely free from bits of burnt paint. It takes only a few minutes to burn off those small patches which are so often overlooked and which are difficult to remove by glass-papering. In the final stages the scraper must be kept very clean, otherwise it cannot produce a smooth

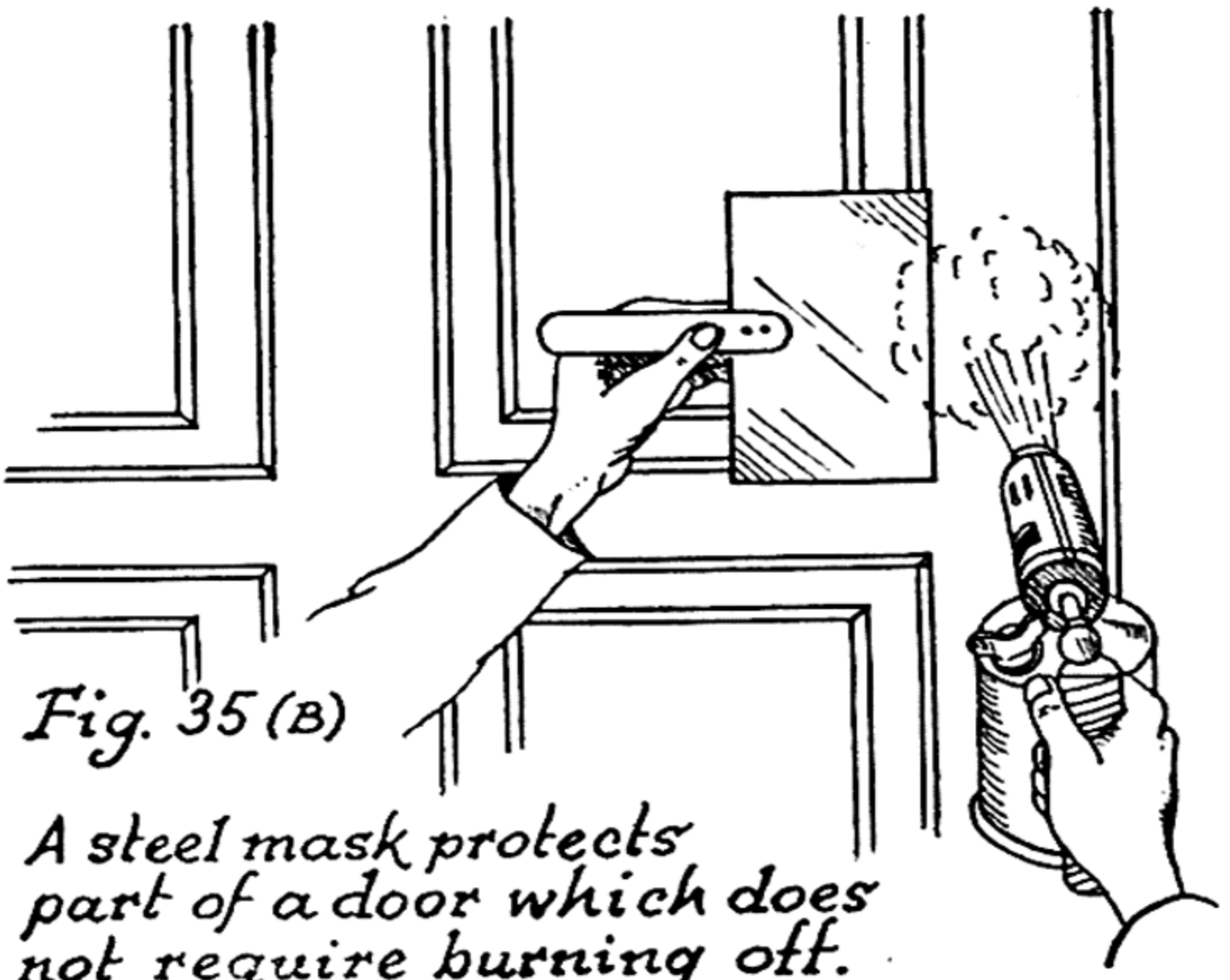


Fig. 35 (B)

A steel mask protects part of a door which does not require burning off.

surface. The woodwork must not be charred, neither must it be damaged as a result of forceful scraping; such defects are difficult to make good at a later stage.

It frequently happens that adjoining paintwork is in good condition, thus requiring protection. (Fig. 35B illustrates a method whereby the stiles and cross-rails of a door may be burnt off without injury to mouldings.) A metal shield is particularly useful in such cases, and also for the protection of glass, when burning off window-frames.

The final smoothing down of these surfaces may be carried out with glass-paper, steel wool (fine grade), or with a carpenters' scraper, again taking care lest sharp edges of mouldings be damaged. The angles and quirks will probably require some scraping with the tip of an old penknife, after which the whole is brushed down with a dusting brush and treated as for new woodwork.

(2) "*Spirit*" *Paint Removers*

These contain powerful solvents and a proportion of wax to retard evaporation. Some are highly inflammable, and are capable of dissolving old paint, varnish, and cellulose: others are effective upon all except cellulose lacquers. They are capable of universal application and are not injurious to the surfaces treated. For the treatment of those parts of window-frames adjoining glass they are ideal. They also simplify the removal of varnish or french polish from natural wood or carved surfaces.

Some varieties have an immediate action, softening the surface coat of paint within two minutes; others act more slowly but penetrate more deeply, and are thus preferable for the removal of paintwork. The majority require several applications, the work being tested at frequent intervals until the working speed of the solvent is ascertained.

The paint is removed by a shave-hook and scraper as in burning off, and if the whole thickness does not respond to the first operation we must repeat the entire process until a satisfactory result is obtained. Finally, the whole surface must be washed down with clean rags and white spirit, to remove traces of wax which are likely to interfere with the drying of new paint. The fumes arising from spirit solvents are sometimes unpleasant, and may, in a confined space, be injurious to health. This indicates the need for adequate ventilation.

(3) "*Caustic*" *Paint Removers*

Although these are the oldest and cheapest of paint or varnish solvents their use at the present time is usually limited to the stripping of varnished wallpapers. They are certainly effective, but because of the risks attending their use, great care must be exercised.

A solvent of this type is prepared from 1 lb. of caustic soda, 1 lb. of flour (or lime), and one gallon of warm water, the whole being stirred until thickening occurs. It is advisable to wear goggles or glasses when handling such compositions and to keep some dilute vinegar on hand to neutralise splashes upon the skin. The sole object of the flour (or lime) is to produce a thicker consistency and thus minimise the risk of splashes which, if allowed to fall upon adjoining paintwork or linoleum, would completely destroy the colour.

These are obviously more suited to exterior, rather than interior surfaces. They are employed in the same manner as spirit solvents and require about half an hour for the penetration of surface coats of paint. They are quite ineffective upon cellulose lacquers and, if used upon natural wood finishes, will penetrate through varnish and permanently discolour the woodwork.

Following the removal of paint, the surface must be "pickled" with dilute vinegar to ensure the immediate neutralisation of alkaline matter which may have penetrated into wood or other porous material. The vinegar is then removed by a very thorough wash down with clean water.

Preparation and Priming of New Surfaces

Under this heading we include surfaces commonly found on many outside jobs. These differ in porosity and in their action towards oil paint; some assist drying

while others retard the effective hardening of paint. Because of these variations, we cannot generalise until we have considered the special requirements, preparation, and type of priming paint, for wood, iron, and cement surfaces. It is during the preliminary stages that we must recognise and solve our problems: after priming, the various surfaces are fairly equal and may be treated as for previously painted work (see Chapter III).

New Woodwork

The routine treatment of unpainted timber should include the following: Projecting nails should be punched below surface level; spots of glue, plaster, etc., are to be scraped off; all end grain, mouldings, and joints must be examined and any roughness removed by dry rubbing down with No. 1 glass-paper; the surfaces of panels and rails may contain rough places, scratches, ridges, or other evidence of poor workmanship which, if neglected at this stage, will show more prominently in the finished work.

These defects are superficial and are more easily remedied prior to the application of paint. It is usual, when glass-papering, to work in the direction of the grain with the abrasive wrapped round a block of cork or rubber (Fig. 36). For mouldings, the glass-paper may be stiffened by folding or, alternatively, may be held over a small piece of wood or leather of suitable shape.

Ridges upon the surface of timber may be due to plane marks or to the curvature of the grain. In any case we must attempt their elimination by rubbing down or by a combined operation of scraping and rubbing. This necessitates the use of a carpenters' scraper held at an angle of about 45° with the surface (Fig. 37). The scraper is similar in effect to a plane, its burred edge

removing an extremely fine shaving when dragged along the offending ridges. After a time the edge loses its keenness and must be restored by a few vigorous strokes



Fig. 36
A rubber faced rubbing block for use with wet or dry glasspaper

with the rounded edge of a screwdriver. If this does not suffice, we can turn up a burr by rubbing the edge upon a flat hone (Fig. 37).

Treatment of Knots

Knots contain a high proportion of resinous matter which is capable of injuring both the colour and drying properties of oil paint, and may, at times, cause blistering. To counter this destructive influence we must seal up the surface of each knot prior to painting. The usual method is to coat the knots, and about ¼ inch of the surrounding surface, with patent knotting (see p. 49). This dries within ten minutes and enables work to proceed at once.

Knotting which has thickened as a result of long storage should be thinned with spirit and tested upon a spare piece of wood to ascertain whether its drying properties have been impaired. Knotting which fails to dry hard is worse than useless. This material should

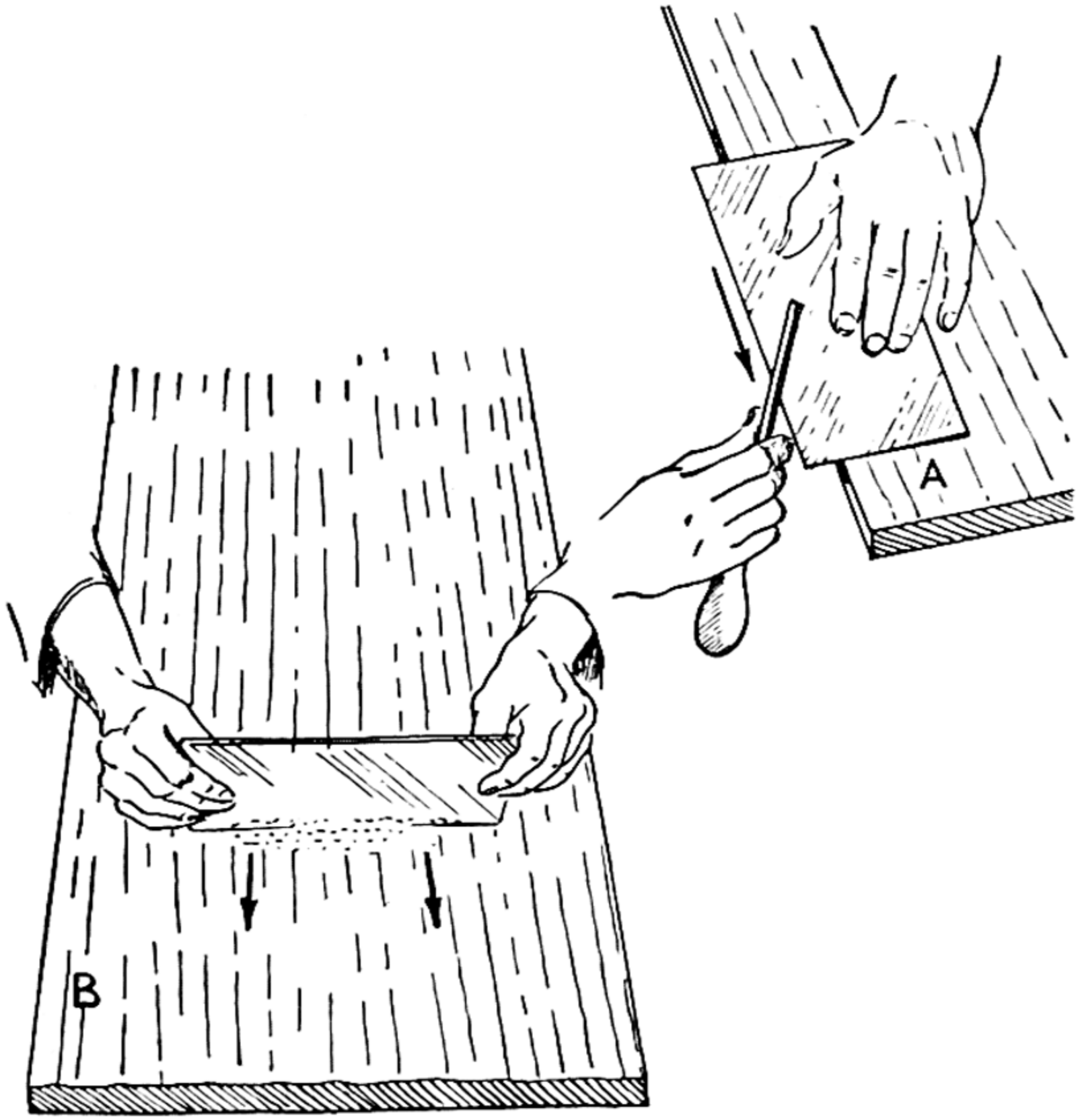


Fig. 37

Using scraper to obliterate plane marks (B)
The edge is sharpened as in (A).

always be kept in glass bottles and tightly corked to prevent evaporation of the spirit. It should never be applied as a thick coating; two thin ones are more effective and are less liable to indicate their presence by a display of thick edges. Aluminium and other metallic paints as well as leaf metal are also employed for the sealing of knots.

Projecting knots are commonly found after the stripping of old paintwork and, if these are loose or unduly large, it is worth while to cut them out and insert sound timber. The alternative is to cut them down with a gouge, to form a hollow which can be filled later (see p. 113).

Other substances which require sealing with knotting are: stains arising from creosote, tar, copying-ink or grease. In each case the surface must first be cleaned by scraping and then by washing with white spirit. Both tar and creosote are difficult to seal, but unless this receives attention any superimposed paint will be discoloured and may remain wet for months.

Priming Paints

We would make it clear that no single priming paint is equally suitable for use upon every type of woodwork. A standard white lead primer will give excellent results when used upon deal and other softwoods, but unless this is obtained in a semi-prepared form—*i.e.*, stiff enough for further thinning—it will prove too oily for hardwoods and burnt-off woodwork. This means that the paint must be thinned with linseed oil and turpentine in amounts most suitable for the type of surface.

Softwoods, for example, are porous and capable of absorbing a large proportion of oil; indeed, the application of a thin, oily paint is beneficial. It penetrates deeply, satisfies porosity, and preserves the timber. A

standard primer is mainly intended for such surfaces and contains the following ingredients: White lead 10 lb.; patent driers ½ lb.; red lead ½ lb.; refined linseed oil 1¾ lb.; turpentine ¾ lb. This gives approximately ½ gallon of paint, and if any further thinning is required, it must conform to the amounts already used —*i.e.*, three parts oil to one of turpentine.

Oak and other hardwoods are similar to burnt-off woodwork, the porosity being considerably less than softwoods. For these surfaces we employ slightly more turpentine than oil and would thin the foregoing amounts of lead and driers, with refined linseed oil ¾ lb., and turpentine 14 to 16 ounces. (*Note.*—In the first instance the total quantity of oil and turpentine is 2½ lb.; in the second case, only 1¾ lb.) This difference is due to the extraordinary thinning capacity of the turpentine: for calculating purposes, one part of turpentine has approximately the same thinning action as two parts of oil.

Anti-drying surfaces are a frequent source of trouble unless treated with a special primer. These comprise the following: Teak, Columbian and Oregan pine, with pitch-pine forming a border-line case. Teak is greasy and capable of withstanding years of weathering without rotting. Because of its resistance to moisture it is sometimes used for window-sills, garden furniture, draining-boards, and in other positions where it is peculiarly suitable. Columbian pine is extremely resinous, and it is this substance which prevents the normal drying of oil paint. It is widely employed in the manufacture of plywood and in ready-made doors imported from abroad.

There are several types of sealing solution which are effective upon all these materials and, according to the amount required, we can obtain a ready-prepared compound or mix a small quantity from materials in stock. Either of the following will form an efficient primer:

(1) Mix equal parts of Japan gold-size and turpentine; or (2) equal parts of knotting and methylated spirit. The work is afterwards treated as a previously painted surface.

Creosote and other bituminous compounds are widely used upon exterior surfaces and, because of their anti-drying nature, are worthy of mention. Weathering plays an important part in the preparation of such surfaces, but if we desire a change of colour, it is very necessary to seal the old material before applying an ordinary oil paint. One of the best sealers for this purpose is a good aluminium paint.

Ironwork calls for a priming paint of the finest quality and preferably containing a high proportion of red lead. If the colour is too bright it can be toned down by the addition of black or other dark colour without affecting its durability. Red lead, thinned to a brushing consistency with two parts boiled linseed oil to one of turpentine (red lead is an excellent drier), makes an ideal paint for the touching up of bare places prior to the general painting of iron railings, metal window-frames, etc.

Galvanised iron and zinc are usually left unpainted for a period of six to twelve months, during which time the surface is slightly roughened by exposure to weather. Should painting at an earlier date be necessary, we can "provide key" by washing the surface with copper sulphate solution. A priming paint similar to that specified for ironwork will be quite appropriate.

Portland cement is capable of holding and exuding moisture for a period of twelve months or more and, if treated with oil paint during this period, the paint may blister or be converted into soap. It is always advisable, even after years of exposure, to prime such material with oil-bound distemper or other alkali-resisting compound before proceeding with coats of oil paint.

While considerable progress has been made in the manufacture of proprietary materials—some are claimed to give satisfactory results upon new cement—an element of risk attends their indiscriminate use. Much depends upon the ability of underlying surfaces to absorb moisture from the cement, and, of course, weather conditions and the total thickness of mortar are important factors in determining the speed of surface drying. In summer-time, and especially in repair work, new cement is usually ready for priming after an interval of one month. Two coats of cement primer may be followed by ordinary oil paint, but success cannot be guaranteed in every case.

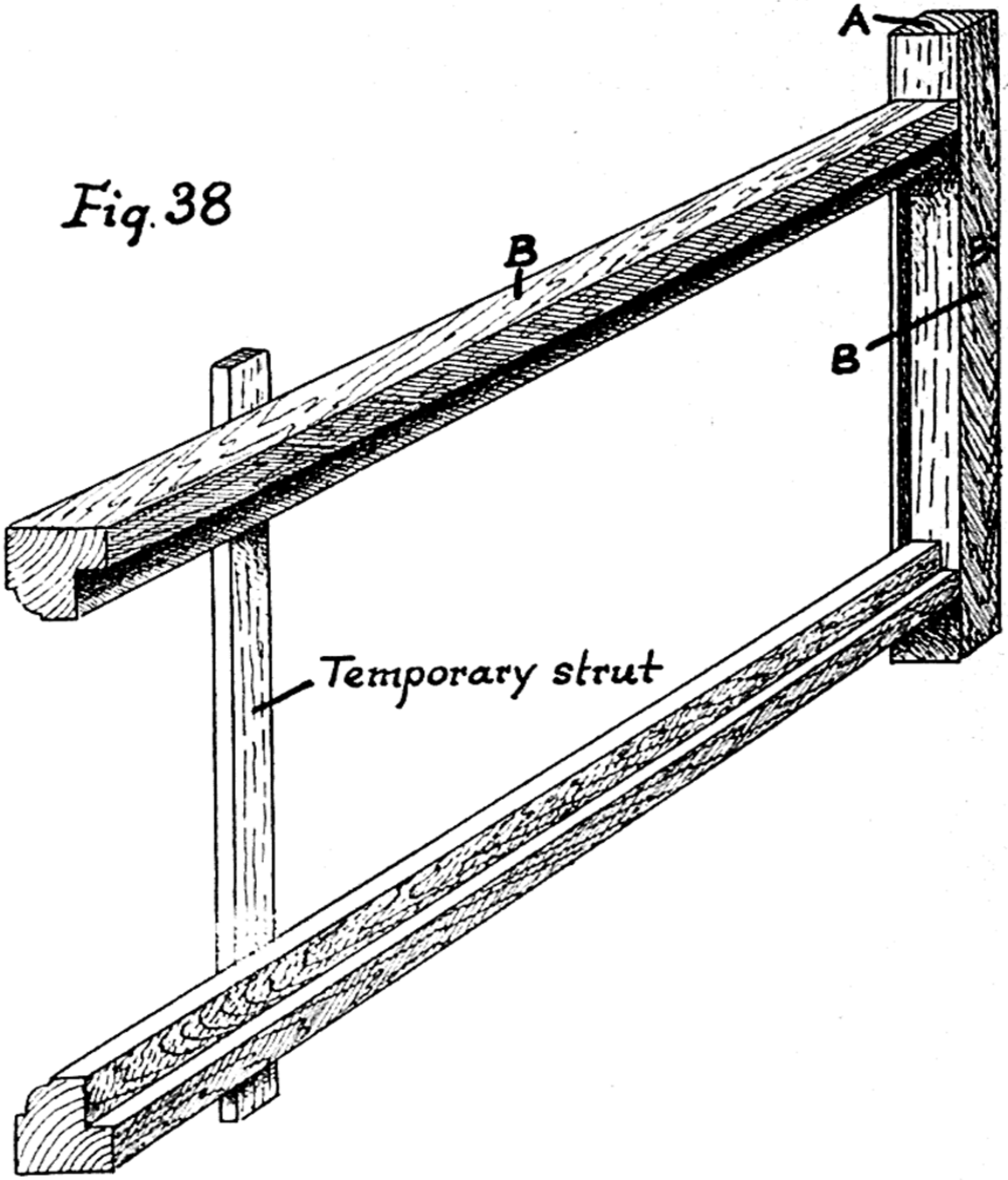
Application of Priming Paints

The main functions of a priming coat are (*a*) to obtain a good grip upon the material painted; (*b*) to stop excessive porosity, and (*c*) to provide a firm and durable foundation which gives adequate key to subsequent coatings. In addition, a paint must perform the secondary duty of hiding or obscuring the surface.

(*a*) The conditions essential for proper adhesion are perfect dryness and cleanliness of surface, and a properly balanced paint—*i.e.*, a paint capable of penetration into porous materials, or containing sufficient boiled oil or varnish to ensure adhesion to non-porous materials.

(*b*) This can only be achieved by using paint of the right consistency and containing the correct proportion of oil and turpentine (see p. 48). Since surfaces vary in porosity, we shall have to find the correct consistency by trial, thinning with the appropriate amounts of oil and turpentine until the paint spreads easily and leaves no ugly brush-marks. It is better to use paint which is slightly over-thinned; we can always balance matters by applying a more liberal coating and thus check porosity.

Fig. 38



End grain (A) and all back edges (B) must be painted prior to fixing.

(*c*) Standard priming paints contain a sufficiency of white and red lead to ensure durability, good drying properties, and opacity. It may appear rather odd to employ a pink primer upon work which is to be finished in white, but experience proves that this procedure facilitates the obscuring of knots, etc., and is therefore advisable for woodwork.

If a priming coat is to fulfil its duty of providing adequate key for later coats, it must not be allowed to become too hard before following coats are applied. The practice of leaving primed surfaces untouched for several months prevents perfect adhesion and induces blistering.

We have already stressed the importance of giving a liberal coating to porous surfaces; this is particularly desirable in the treatment of end grain and even more important in the case of sills, door casings, window-frames, and other items which are best primed before fixing. The edges of these items can never be painted after fixing, so we should apply at least one good coat beforehand (Fig. 38).

A point frequently neglected is the painting of nail-holes and nail-heads. It requires some patience to dab the paint into each, but the job should be done with a flat fitch or other small brush prior to tackling the main surfaces. Any neglect here may lead to rusting of the nail-heads with consequent injury to surrounding woodwork. Furthermore, if the sides of nail-holes are left unprimed, the oil will be absorbed from any applied putty, with deteriorative results.

CHAPTER III

UNDERCOATING AND FINISHING

Mixing and application of undercoats, stopping, gloss finishes and water-paints.—The painting of skylights, gutters, eaves, fall-pipes, window-frames, doors, railings, etc.—Varnishing of painted and unpainted woodwork.—Amounts of Material required.

Paint and Colour Mixing

In view of the ever-increasing brands of ready-mixed paints, one might well ask whether any useful purpose is gained by mixing paint at home. If we feel that we are getting good value in some particular brand there is no point in changing, but if we are unacquainted with a good proprietary make and are unable to buy a paint of standard quality, then we cannot fail to derive satisfaction from a home-made compound of the right materials. Much depends upon the type of finish required, and in this connection we should note several points likely to assist in the selection—or rejection—of materials offered.

To compare the thousands of ready-prepared brands of paint would be a severe test for any one individual, yet all are mixed from a limited group of materials which, according to their quality, must obviously affect the cost of the product. If we are prepared to pay a fair price it is logical to assume that any reputable firm will supply goods of standard quality.

We can also purchase paints the composition of which is guaranteed to conform to specifications issued by the British Standards Institution. The following are but a few: B.S. No. 261 denotes ready mixed, oil-gloss paint

(white lead base): B.S. 262 includes several tinted varieties of the same material; B.S. 929 includes primers, undercoats, and finishes. A number of colours, paints, oils, driers, varnishes, and thinners are standardised and numbered, all of which assists both buyer and manufacturer alike.

The foregoing, along with numerous high-gloss paints and varnishes, are often listed as of "Decorators' Quality," to distinguish them from inferior goods intended for household purposes generally. We would say here that a good high-gloss paint (Decorators' Quality) is usually superior in gloss to its home-prepared counterpart. Such paints are also described as Gloss Enamel Paints, Varnish Paints, Synthetic Enamel Paints, Chinese Lacquers, etc., but not as Enamels. The latter being a separate and more expensive type.

To generalise, we may group the chief materials under six headings, the first pair being used as undercoats and the remainder as finishes. Primers have already received attention (p. 48) and are therefore not included in the following:

(1) General-purpose White-Lead Paint forms a good and durable undercoat for almost any type of finish (p. 161). It can be purchased under its B.S. No. (261 or 262) and thinned with turpentine to produce the required half-gloss, or may be obtained as a semi-prepared, or semi-gloss paint, preferably of similar colour and tone to the final coat. Tone is of particular importance; a dark finish requires an undercoat of dark tone while medium and pale finishes call for medium and pale tones respectively. Examples, which may be taken as a general guide, can be prepared by the addition of small quantities of tinting colours to the basic white used:

Finishing colour.	Undercoat required.	Tinting colours employed.
Ivory and Silver grey.	White.	
Cream and Pink.	Pale cream.	White and yellow ochre.
Pale yellow.	Deep cream.	White and yellow ochre.
Sky-blue.	Silver grey.	White and 1% of black.
Light grey.	Silver grey.	White and 1% of black.
Light green.	Silver grey (greenish).	White and 1% black and 2% Light Brunswick green.
Middle green.	Medium grey (greenish).	White and equal parts black and Light Brunswick green.
Royal blue.	Medium grey (bluish).	White and black and Prussian blue.
Medium brown.	Medium grey (brownish).	White and black and yellow ochre.
Dark green.	Darker tones of foregoing greys.	
Dark blue.		
Dark brown.		
Black.	Lead colour (dark).	White and black.

The production of the various tints is a simple and straightforward job requiring more patience than skill. In this work we must achieve our object without haste, remembering that colour can always be added, but any excess cannot be removed. Colours should be of good quality and, before addition to paint, should be mixed upon a clean board, using a little oil and turpentine to increase fluidity (Fig. 39). If dry (powder) colour is employed, this must be mixed until of a smooth, cream-like consistency. Coarse powder may present some difficulty, and in many cases may have to be ground between two slabs of smooth stone to produce a fine texture.

(2) Special Undercoating (p. 47) is usually deficient in body, toughness, and general water-resisting qualities. Its special claims lie in its handiness—it is always of the correct colour for its particular finish—in its quick-

drying nature, and in its chemical compatibility with the type of finish employed. As a general rule the advantages are considerably outweighed by the lack of durability.

(3) Oil-Gloss Paint (B.S. 261 and 262) is really intended as a finishing coat upon gutters, barge-boards, railings, and other outside work where a really high gloss

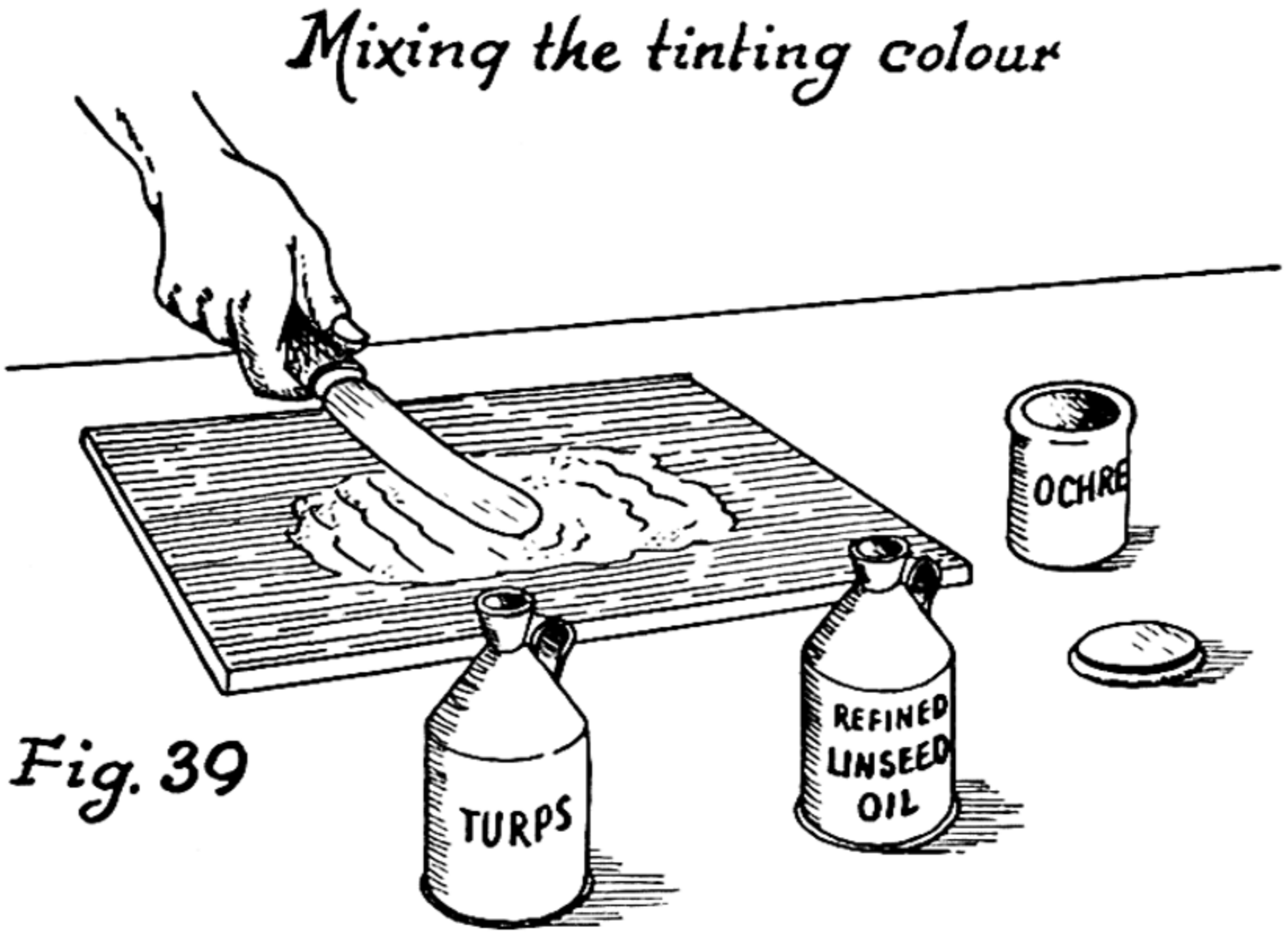


Fig. 39

is secondary to durability. These paints are approximately two-thirds the cost of high-gloss paints, and, because of the increased weight per gallon, the cost per yard of surface painted is even lower. Both gloss and smoothness of finish can be improved by the addition of anything between ½ and 1 pint of mixing varnish to a gallon of the paint.

(4) High-Gloss Paints are quite different from those already mentioned. An oil-gloss paint, for example,

contains a high proportion of solid colouring matter and considerably less oil and turpentine; the result is a heavy paint of excellent obliterating qualities. On the other hand, we can combine equal weights of solid matter and varnish, to produce a great improvement in gloss, but at the expense of obliterating capacity. We cannot have perfection in both properties; one must always predominate to the detriment of the other.

(5) Enamel is mainly employed to secure a high-gloss finish in pure white. This material is superior in colour, gloss, smoothness, and durability, but is so poor in obliterating capacity that the final undercoat must present a surface perfectly free from blemishes. Such perfection can rarely be secured with less than four undercoats and, to gain the required whiteness, the last coat must be of zinc white. Enamel contains the best of resin, varnish, and pigment, and usually withstands years of hard wear before final brittleness occurs.

(6) Varnish (see p. 50) has long been used for the protection and enrichment of painted, grained, natural wood, and other surfaces. Here we have a finish entirely free from coloured pigment and, in consequence, one which produces and retains its high gloss for a longer period than most high-gloss paints. It is not limited to a one-coat job—high-class work is varnished twice—and presents no special difficulties when the surface is eventually prepared for repainting.

The popularity of gloss paints is mainly due to economic factors; it is, in effect, like putting paint into the varnish in order to save time. In varnishing we must usually apply an extra undercoat to secure perfect evenness of colour, a job which obviously requires extra time, but which gives additional protection to the work painted. To the amateur, a painted and varnished job is worthy of serious consideration, not only because of its quality,

but (as the following table indicates) because of its price per square yard and the ease with which it is applied.

TABLE SHOWING THE COMPOSITION, COMPARATIVE COST AND AREAS COVERED BY VARIOUS MATERIALS

Material.	Composition, per gallon.				Weight per Gallon.	Cost.	Area covered per lb.	Cost per sq. yd.
	Pigment.	Oil.	Turps.	Varnish.				
	lb.	lb.	lb.	lb.	lb.	*s.*	sq. yds.	*d.*
Priming paint.	21	3½	1½	—	26	15	3 to 4	2
Undercoating.	21	2	2½	—	25½	15	4 to 5	1¾
Oil-gloss paint.	18	5	½	½	24	15	5	1½
High-gloss paint.	6½	—	—	6½	13	20	6	3
White enamel.	7	—	—	7	14	35	6	5¼
Gloss varnish.	—	—	—	—	9	18	10	2¼

Note.—(*a*) Driers are not shown as a separate item, but have been added to the oil in the proportion of one part terebine to sixteen parts of oil.

(*b*) In view of frequent price fluctuations we have quoted the more stable costs operating in 1940. All figures are approximately correct, and are based upon average results obtained during the painting of woodwork.

Since mixed paint is sometimes sold by weight and sometimes by volume, we have given the average weight per gallon, and the area covered per pound of the various materials. From these figures it is not difficult to calculate the area covered by 1 gallon, quart, or pint, of each.

MIXING THE PAINT

Oil paint is a mixture of four basic ingredients, enumerated as follows: (*a*) Paste colour (the solid constituent); (*b*) linseed or other drying oil; (*c*) driers, and (*d*) a thinner or solvent (see p. 46). All can be obtained from a decorators' or builders' merchant, the colours being available in the form of a stiff paste—*i.e.*, dry pigment ground in linseed oil—and sold by weight. The liquid ingredients are sold by the gallon, pint, half-

pint, etc., according to the amount required: 1 pint of turpentine weighs 17 ounces and 1 pint of linseed oil weighs 18⅔ ounces. Painters have all these facts memorised, and are able, as a result of long experience, to judge amounts by weight or volume. Their method is not mere "rule of thumb," as one might suppose.

Paste colours vary in weight, durability, in their ability to absorb oil, and in other respects apart from the more obvious differences of hue. Some are permanent in colour while others are inclined to fade as a result of exposure; these points must be taken into consideration when mixing paints. We shall, in the following table, give suggestions for the production of tints and shades which can be prepared from the more permanent and easily obtainable colours.

Tints required.	Basic colour.	Tinting colours.
White.*	4 White lead.	1 Zinc oxide.
Ivory.	20 White lead.	1 Ochre; 1 Raw umber.‡
Cream.	10 White lead.	1 Ochre.‡
Buff.	4 White lead.	1 Ochre.‡
Stone.	10 White lead.	1 Ochre; 1 Burnt umber.‡
Primrose.	10 White lead.	1 Pale chrome.
Fawn.	6 White lead.	1 Ochre; 1 Raw umber.‡
Old gold.	2 White lead.	2 Orange chrome; 1 Burnt sienna.
Orange.	1 White lead.	2 Orange chrome.
Warm grey.	20 White lead.	1 Venetian red; 1 Black.
French grey.	30 White lead.	1 Black; 1 Crimson lake; 1 Prussian blue.
Sky-blue.	100 White lead.	1 Prussian blue.
Royal blue.	2 White lead.	1 Prussian blue.
Dark blue.	10 Brunswick blue.	1 White lead.
Apple green.	6 White lead.	1 Light Brunswick green; ½ Chrome yellow.
Nile green.	6 White lead.	1 Middle Brunswick green.
Grass green.†	Light Brunswick green	⅛ Yellow ochre.
Bronze green.	Middle Brunswick green.	⅛ Red oxide.

Tints required.	Basic colour.	Tinting colours.
Deep green.†	Deep Brunswick green.	⅛ Yellow ochre.
Bottle green.†	Deep Brunswick green.	⅛ Yellow ochre; ¼ Black.
Coral pink.	4 White lead.	1 Chrome; 1 Signal red.
Salmon.	2 White lead.	1 Orange chrome; 1 Venetian red.
Brick red.	Venetian red.	
Purple red.	Indian red.	
Russet red.	2 Venetian red.	1 Light Brunswick green.
Walnut brown.	1 Venetian red.	1 Light Brunswick green; 1 Yellow ochre.
Warm brown.	1 Red oxide.	1 Middle Brunswick green.
Chocolate brown.	1 Red oxide.	1 Black.
Black.	Black in oil.	
Lead colour.	1 White lead.	1 Black.

Approximate bulk quantities are indicated by numbers.

* The inclusion of approximately 20 per cent. of zinc oxide is always advisable in finishing coats of white and very pale tints. This is a common device calculated to preserve purity of colour for a much longer period.

† A touch of yellow ochre has a similar effect upon Brunswick green: it prevents the tendency towards blueness which otherwise occurs when exposed to weathering.

‡ In these cases the ochre may be of a dull yellowish variety, *e.g.*, Oxford, Spruce, or Italian ochre.

In all cases the proportions given must be regarded as approximate. The staining or tinting strength of different makes of colours will be found to vary considerably; tube colours are very powerful and must be used sparingly, but cheap colours are usually the reverse. The main advantage of strong tinting colours is that these enable a higher proportion of white lead to be used—an important consideration in the case of pale tints.

The type of colour employed will affect the drying of a paint. The lead pigments, which include white lead, red lead, orange, and yellow chrome, are all good in their drying action, but other pigments, particularly the reds,

blacks, blues, and yellows, absorb a large amount of oil during the grinding process and thus require additional driers. We should, when mixing, notice the amount of any poor-drying colour used, so that we can add driers over and above the amount necessary for the oil employed in thinning the paint.

The appliances required for paint mixing are: Two clean tins of suitable size; a strainer with mesh of fine muslin; an old paint brush; a smooth mixing stick of 12 inches by 1 inch by ½ inch; clean rag; apron or overall; an improvised palette board and mixing knife, and, of course, the paint ingredients. It is an advantage to be able to work in comfort upon a bench, especially if this happens to be situated in a tool-shed away from the house. Paint is liable to splash, and, if mixed in the house, floors, etc., need the protection of an old dust sheet.

It is a good plan to commence by mixing the desired proportions of oil, turpentine, and driers, in a separate bottle. Put about 2 ounces of the mixture into one of the clean tins and whirl it round to wet the sides. This prevents masses of pigment from sticking. Add the full amount of basic colour and, with the flat stick, stir until a smooth mixture results. It is helpful in the case of white lead and other stiff pigments to add less oil at the outset, and to break up the mass by pressure against the side of the tin; firstly, with the edge and then with the flat side of the stick. The oil mixture is incorporated, a little at a time, until a creamy consistency is obtained (Fig. 40).

At this stage the colour should be sieved into a clean tin to ensure a more thorough breaking up of the particles before the addition of tinting colours (Fig. 41). Any paint skins and other coarse matter which cannot be brushed through the strainer are quite useless, and should be

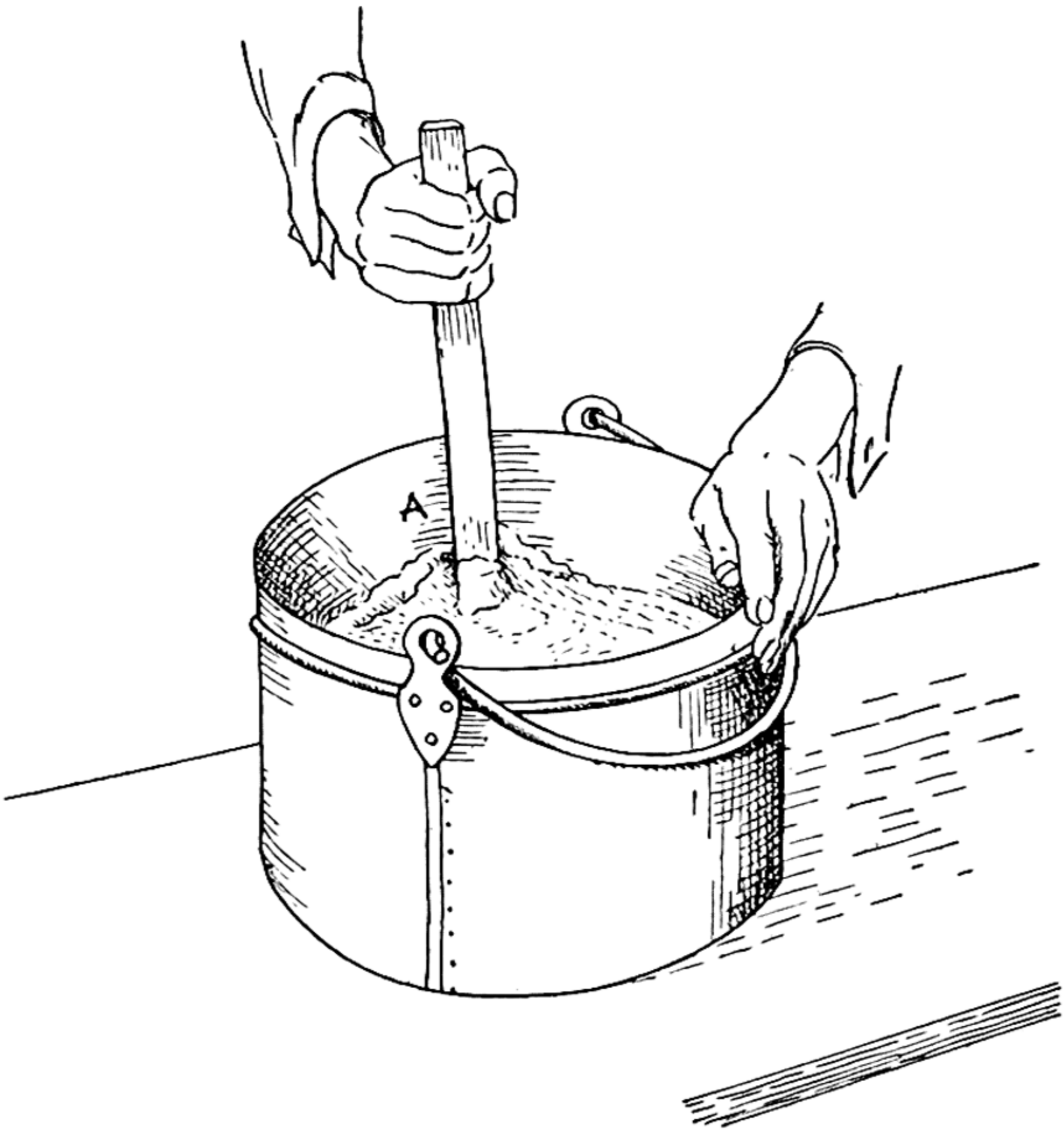


Fig. 40

Paste colour is mixed by pressure against the side of the paint kettle (A).

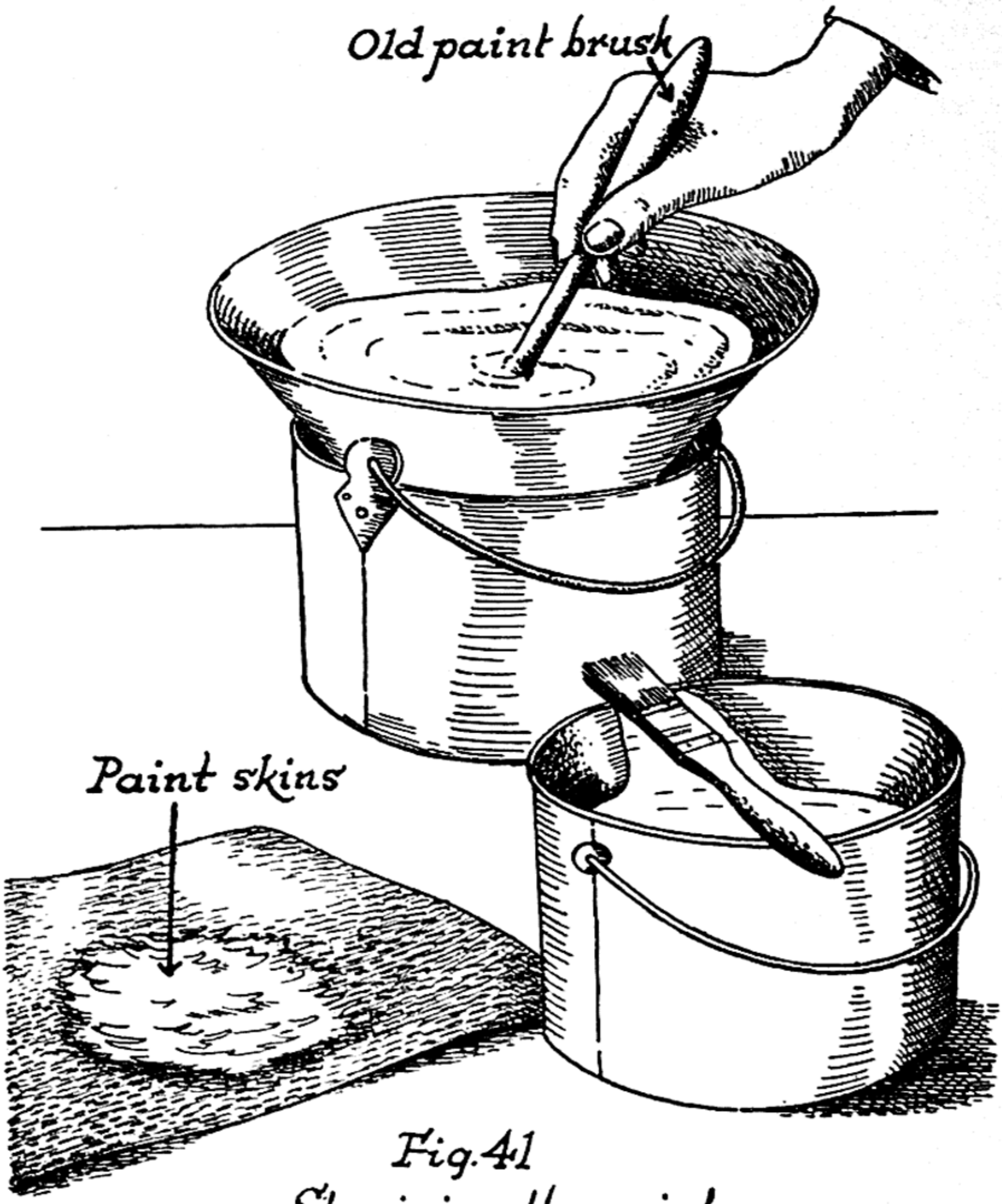


Fig. 41
Straining the paint
to eliminate coarse particles.

burnt. Pour the paint into the mixing tin in readiness for tinting.

Tinting colours should be mixed separately, using an improvised palette board (Fig. 39) for small amounts and a clean tin for larger quantities. If these are insufficiently broken up they will, when added to the paint, appear considerably darker and stronger when finally strained, hence the need for care. After use, the sieve can be rinsed in paraffin, dried with a clean rag, and put away for further use.

The exact consistency can only be ascertained by trial upon the actual work to be painted. If paint is mixed a day or two before use, the ingredients undergo certain changes, becoming more perfectly amalgamated and, in consequence, the brushing qualities are vastly improved.

During any period of storage the paint should be kept under air-tight conditions, which are usually secured by covering the surface with linseed oil and using a tight-fitting lid. To be really effective, the tin must be of a size just capable of holding the paint, but with little or no air space, otherwise turpentine evaporates and air combines with and thickens the paint, thus causing real depreciation in quality. Paint remains in good condition for several months, but after a year or so becomes gummy. Such paint is of little value except for painting the insides of gutters, for which purpose it is thinned with turpentine substitute only.

Thinning of Proprietary Materials

In the majority of cases, gloss paints and varnishes are supplied in a ready-for-use form, while undercoats permit certain additions of oil or turpentine (see p. 47) strictly in accordance with manufacturers' instructions. This procedure operates successfully providing that the

material has not been too long in stock, or is not applied in very cold weather.

Where any difficulty is experienced and there are no available instructions, it is advisable to adopt the following measures:

(1) Stir the paint thoroughly (after removing any surface skin) and take out ¼ lb. for experimental purposes.

(2) Try the effect of warmth. This can be done with safety if we adopt the glue-kettle principle—*i.e.*, stand the paint tin in a larger vessel containing hot water. Heat renders the oil more fluid and at the same time provides the only means whereby this can be done without risk.

(3) Should the above method fail, we shall have to try the addition of turpentine, limiting the amount to about 5 per cent. of the volume of paint. This to be well stirred and given a fair trial before proceeding further.

(4) To add turpentine in excess of 10 per cent. is almost certain to reduce gloss; a point which can only be ascertained by trial extending over several days. A trial of this nature should be extended to test the reaction of an addition of 10 per cent. mixing (or other) varnish. If this can be incorporated without thickening the mixture, it will offset the undesirable action of the turpentine and might usefully replace at least part of the latter.

The restoration of old paint or varnish can never be guaranteed, and where the above methods prove ineffective we must regard the material as so much "smudge" (fatty paint), to be thinned with turpentine substitute for rough or less important work. Should our efforts be rewarded, the restored material can be allowed to trickle through the sieve by no other force than that of gravity: a method which always secures the best result.

The drying properties of old paint and varnish are usually impaired and requiring attention. We can, of course, employ from 2 to 5 per cent. of terebine driers in lieu of turpentine (except in white paint), or we may employ Japan gold-size, or a "liquid oil drier"; the latter being of similar strength to terebine, but of a pale and glossy character which makes it most suitable for this particular job. The compatibility of the drier and paint (or varnish) should always be tested on a small scale before dealing with large amounts.

Changing the colour of ready-mixed paints can usually be accomplished within certain limitations. Undercoating paint presents no special difficulties, with the result that wide variations are possible. With gloss finishes the position is always uncertain; some makes combine remarkably well with paste colours ground in oil, others undergo a peculiar chemical change which causes partial solidification of the paint, an action which is sometimes immediate and at other times may require twenty-four hours. In all cases it is obviously advisable to experiment on a small scale until a workable method is discovered.

Delicate tints and slight alterations can usually be obtained successfully by (*a*) the use of dry colours, (*b*) colours ground in turpentine, or (*c*) by mixing paste oil colours with turpentine, and spreading the substance on blotting-paper to extract the oil. Any of these oil-free colours can be mixed upon a palette board, using the gloss paint as a thinner, then adding the tinting colour in small quantities until the desired effect is secured.

Distemper is usually obtained as a stiff paste, to be thinned for use with cold water, or with a special thinner supplied by the maker. The mixing of distemper is facilitated and the time considerably reduced by heating the paste over a gas ring. The whole mass softens within

a few minutes and can be broken up to a smooth paste as in paint mixing. Subsequent thinning must be in accordance with the manufacturers' instructions, after which the colour is strained through a metal gauze sieve.

Compounds for Stopping and Levelling

"Stopping" means the filling of holes and cracks with a suitable composition or putty, which is also termed "stopping." The best time for carrying out this operation is: (*a*)—In new work—immediately after the priming coat is dry, and (*b*)—in old work—after rubbing down, but before painting. The latter refers to all work involving one or two coats of paint, but for three-coat work the stopping should be done between the first and second coats of paint.

The simplest compound is a stiff dough prepared from whiting and refined (not boiled) linseed oil; a compound known as painters' putty. To be used successfully, this must be free from grit, reasonably soft to handle, and entirely free from stickiness. The latter can be removed by kneading in a little dry whiting or plaster of paris. This type of putty is mainly employed upon surfaces other than doors. It is rather slow in hardening and is lacking in strength and adhesive qualities.

For doors and best work it is better to use a more tenacious compound capable of setting to a hard surface within ten hours. There are several mixtures ranging from a straightforward white-lead putty (one part paste white lead to four of ordinary putty) to a really hard stopping made from any one of the following formulæ:

(1) White-lead putty, plus 10 per cent. of red or orange lead mixed with Japanners' gold-size; the whole to be dried off with whiting.

(2) White-lead putty, plus 10 per cent. whiting and gold-size. Any of these can be coloured by the addition

of dry pigment or by stiff paste colour in oil, but whatever the compound, it must be mixed upon a clean board until quite smooth and free from grit.

Stopping should always be applied with the appropriate knife (Fig. 42) or with a chisel knife (Fig. 13), using considerable pressure so as to pack the whole depth of the cavity. Lead compounds are poisonous and are held upon a small palette board which also provides a surface upon which to clean the knife blade prior to the general smoothing of each cavity stopped. There is a knack about this job and it requires practice to produce a perfectly level surface. Stopping must not be left to harden upon areas surrounding cracks and holes; if the job is properly done there is no need to glass-paper before painting. Points requiring special attention are dents, scratches, angles between mouldings and panels, and the fine cracks between window-panes and adjoining putty. A special tool, particularly useful for angles, can be made from an old table knife (Fig. 42).

Compounds for Filling

A filler is absolutely necessary in those cases where domestic pets have scratched deep furrows in doors or other painted surfaces. The work should be prepared, primed, and, when dry, coated with one of the following pastes:

(1) Alabastine (a proprietary plaster) mixed to a smooth, creamy paste with water.

(2) Equal parts oil-bound distemper and plaster of paris, mixed with water.

(3) Paste white lead with an equal amount of fine whiting mixed with quick (Japanners') gold-size and a little terebine drier.

These are applied in the same manner as plaster,

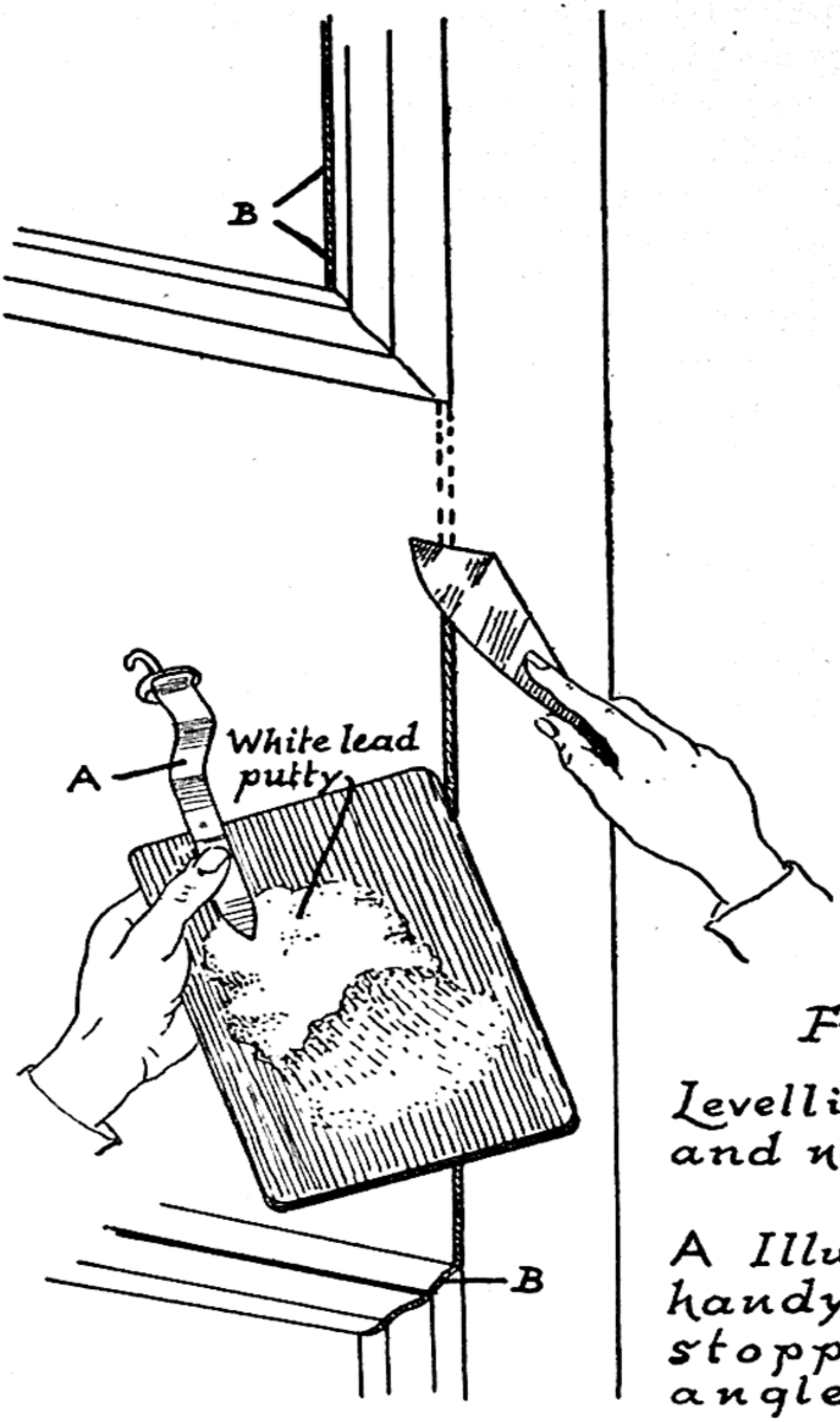


Fig. 42

Levelling cracks and nail holes.

A Illustrates a handy tool for stopping the angles (B).

using a broad scraper with a clean blade. The object is to fill all hollows and leave the high spots bare and, by using a paste of suitable consistency (like thin cream), a smooth surface results. (1) and (2) can be rubbed down with fine (dry) glass-paper within a few hours, but the lead filler should be rubbed down with waterproof glass-

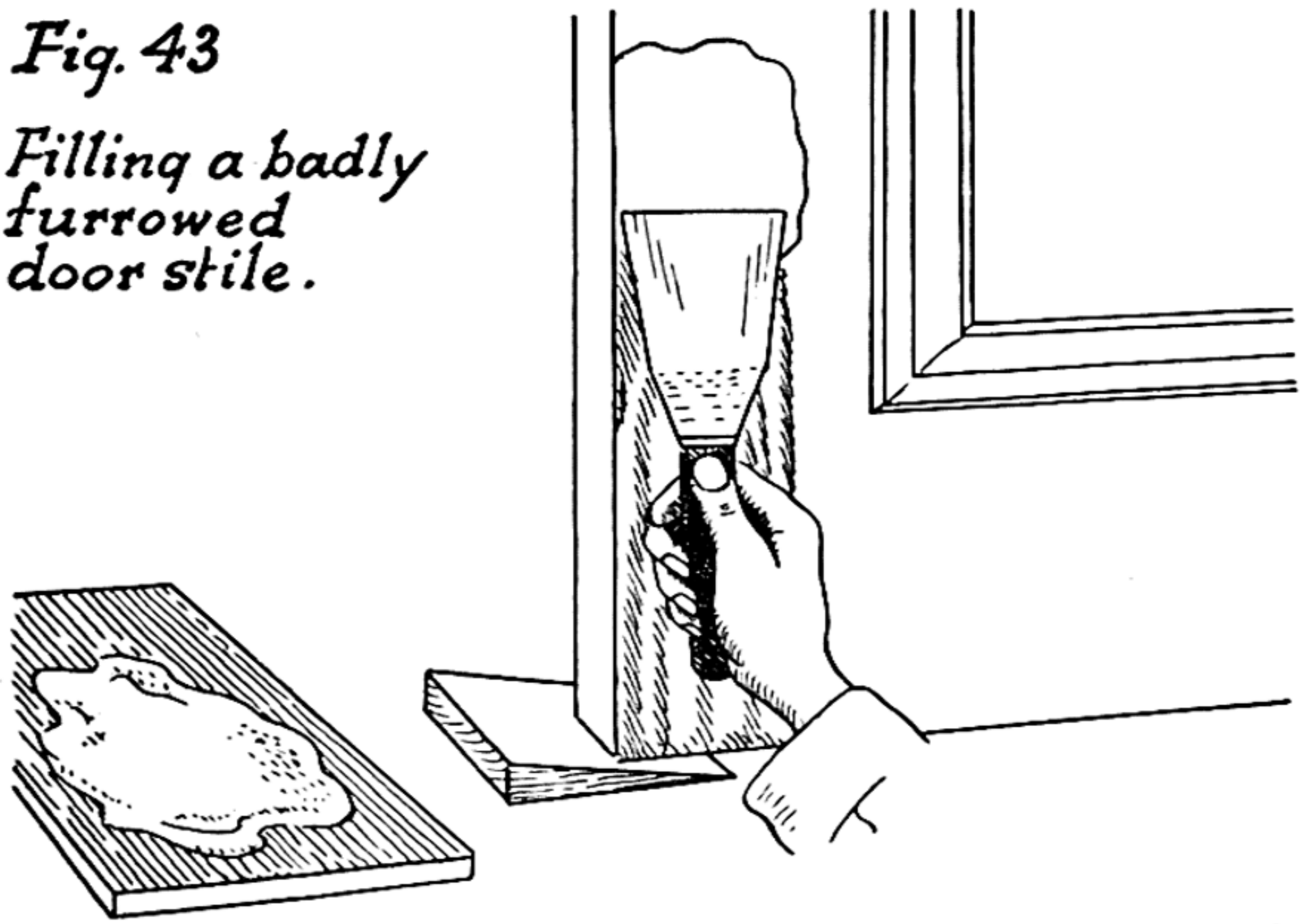


Fig. 43

Filling a badly furrowed door stile.

paper after about twenty-four hours. The latter is particularly suitable for outside work and is more plastic and durable (Fig. 43).

Grain Filler

This substance has certain special uses in connection with varnished rather than painted surfaces. It is expensive to buy, but is cheaply and easily prepared at home. Its use is for the filling and levelling of the open grain of oak, teak, and other hardwoods, prior to varnishing.

It can be employed after staining or in place of staining, to bring out the natural beauty of the figuring, and for those who prefer a smooth finish it provides a quick-drying and easily applied composition.

The filler is prepared from whiting and turpentine, mixed in a clean tin, to a varnish-like consistency. Tinting colours may be ground in oil or added as dry pigment until the colour is several shades deeper than the woodwork; we now add about 5 per cent. of gold-size, which serves as a fixative, and the material is ready for use.

Nail-holes should be filled with plastic wood and glass-papered to a smooth surface, after which the grain filler is rubbed into and across the open grain, using a pad of clean rag for the purpose. Two applications are usually necessary for the perfect levelling of a surface, and in about half an hour the work is rubbed down with fine glass-paper (in the direction of the grain) until the surface is clean and filler is left in the pores only. The work is now ready for varnishing or french polishing as desired.

Painting

Roof Work should be tackled at the earliest opportunity in order that dust may be removed before gutters are cleaned out. There should be no skimping of the work because of difficulties of approach. Roof work is exposed to conditions more severe than other situations and thus requires more than usual in the way of protection. Skylights are usually attended to, but the coping of barge-boards, and especially the back edges, are too often overlooked. The results of neglect are rot, and rotten woodwork is like tinder awaiting a spark from some near-by chimney. A point also overlooked.

The method of approach requires deliberate and careful planning regardless of time spent. Roof work should proceed in a cool and leisurely manner, remembering that the safest method is usually the easiest and most comfortable. Be ready to take advantage of structural features, such as chimney-stacks, rain-water pipes, ridge tiles, valley gutters, flat roofs, and copings, as well as the more obvious appliances—ladders, duck-boards, ropes, short planks, cramps, etc. (see Fig. 11)—and last, but by no means least, the services of a reliable assistant.

Here are a few suggestions which should simplify the main problems associated with roof work.

(1) Wait for suitable weather conditions. It is too risky to attempt the work in a high wind, or when the roof tiles are wet and slippery.

(2) See that the ladder projects well above the gutter and is firmly lashed to a fall-pipe, cramp, or to the base of a convenient chimney-stack.

(3) Since much of the work is done in a sitting position it is advisable to wear overalls and an apron with pocket large enough to contain a scraper, dusting brush, and a piece of rag. Shoes are equally important; a light pair with rubber soles will grip the slates or tiles in dry weather, but are dangerous should rain occur.

(4) A chimney-stack situated near the eaves (or a stout coping) provides a solid footing for ladders, duck-boards, etc.

(5) The presence of a valley (Fig. 44), especially when lead covered, will often provide the easiest and safest approach to the ridge tiles, and thence to other parts of a roof where the angle of slope is greater.

(6) Gutters, ridge tiles, asbestos, or other fragile roof material must never be trusted to carry much weight unless reinforced by light timber work or duck-boards.

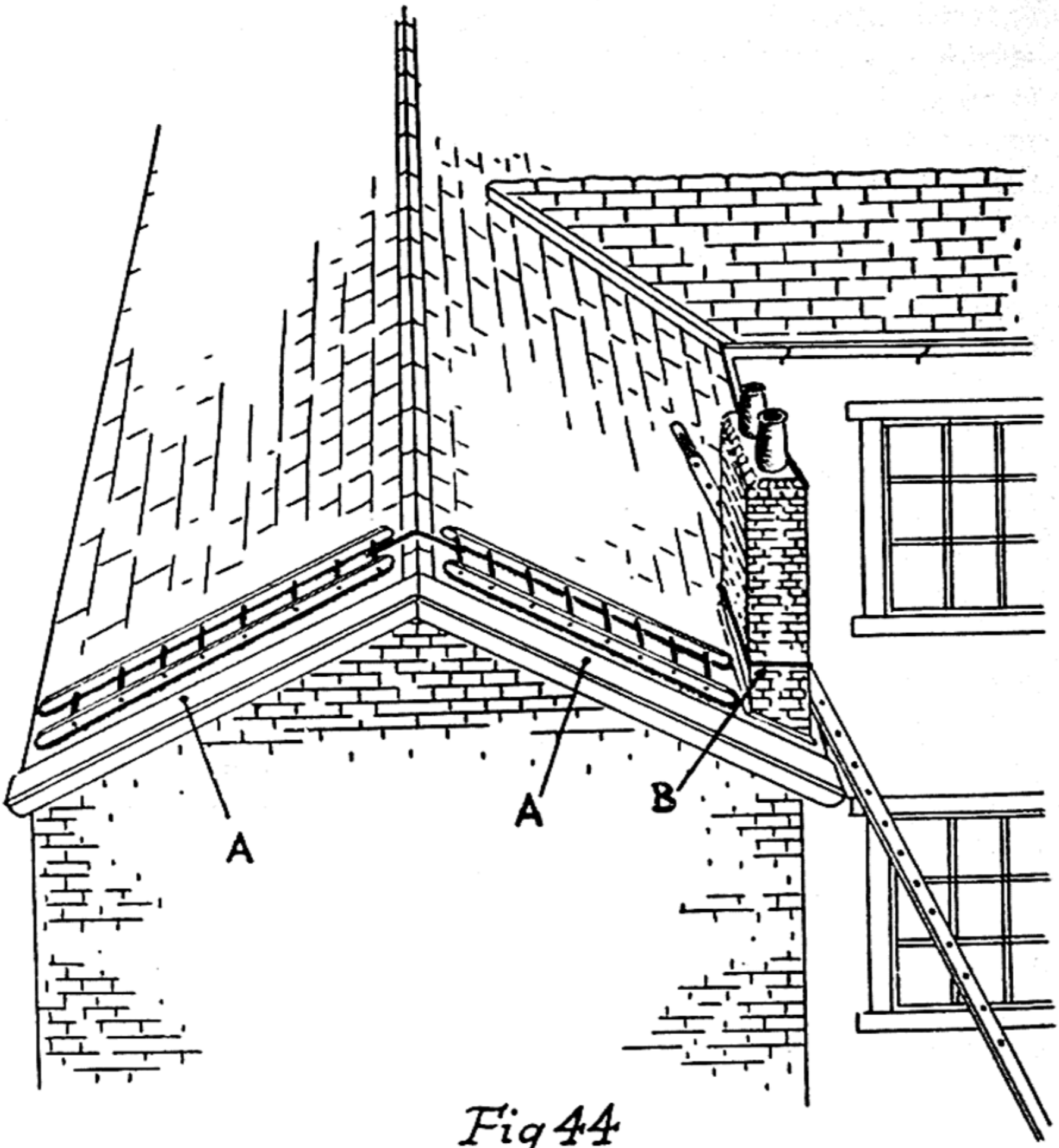


Fig 44

Ladders lashed across ridge tiles for easy access to coping of bargeboard (A) A third ladder is secured at base of chimney (B)

(7) To place duck-boards, etc., upon a roof, it is safer to seat one man upon the roof immediately behind the ladder head to receive one end of the board when carried up by the second man. Meanwhile, the first man can render assistance by hauling up with a stout rope.

(8) Because of overlapping edges of roof tiles it is difficult to manipulate cat-ladders, etc. These can often be controlled from one end by turning the ladder over and over in a sort of rolling motion until the desired position is reached.

(9) Do not hesitate to use a life-line or noose of rope around the waist. One end can be held by an assistant situated on or behind the ridge tiles. The feeling of security thus gained is very helpful.

(10) Avoid reaching out beyond the roof. Utilise the idea shown in Fig. 10 when any portion of the work involves undue stretching.

(11) Use a broad and rather squat type of paint kettle containing no more than 1 lb. of paint. This is less likely to tip over during painting operations. Putty is easily carried when stuck upon one side of the paint kettle, but can be removed and made to serve as a wedge for the paint pot when the working station is reached.

(12) When a ladder foot is placed upon a flat roof make sure that the roof is strong enough to carry the weight. In the case of wooden sheds it is advisable to distribute the weight by resting the ladder upon a plank, as for lawns (Fig. 7). Struts can be placed inside a shed to take up the strain.

The author makes no apology for the inclusion of these seemingly elementary points and would at any time welcome further suggestions of practical value for beginners. So far as we are aware, this important subject has received little or no mention in published works.

Skylights require little preparation beyond scraping, dusting, and the stripping and renewal of loose putty. At this stage hinged lights should be opened and the hinges oiled or greased; the surrounding lead work should be examined and any projecting nails or loose pieces made secure.

In painting, the sash can be held open by a wedge until the underlying frame and then the undersides of edges have been coated. If possible, the skylight should remain slightly open (secured from the inside) during painting operations and until the work is dry and hard. The job can be accomplished with a 1½-inch flat paint brush (see "Painting of window-frames," Fig. 48), including any surrounding lead containing nail-heads or defects, such as cracks, which must be rendered water-proof by painting and stopping. Attend to the filling of fine cracks between the glass and putty, and leave the glass clean and free from paint spots on completion. If in doubt as to how much to paint, coat all surfaces which cannot be painted from the inside. Incidentally, the possibility of reaching awkward positions from inside the house should always be considered; the under-boarding of eaves is a case in point.

Wood coping is frequently employed to cover the edges of barge-boards on house gables. This can be reached from ladders placed and lashed at either side of the ridge tiles (Fig. 44). No attempt should be made at painting the actual barge-board, and the more difficult parts of copings should be reached in comparative safety by means of the brush extension (Fig. 10).

Loose slates or tiles should be observed, marked, and slid back into position. These can be secured by the simple expedient of passing a narrow strip of lead or zinc beneath each tile and hooking it over one of the battens beneath. An assistant can attend to this part of the

job from inside the attic; the lead is then turned up to form a hook on the outside and the tile secured by a blob of white-lead putty (Fig. 45). A broken slate or tile can often be made watertight by fixing a large

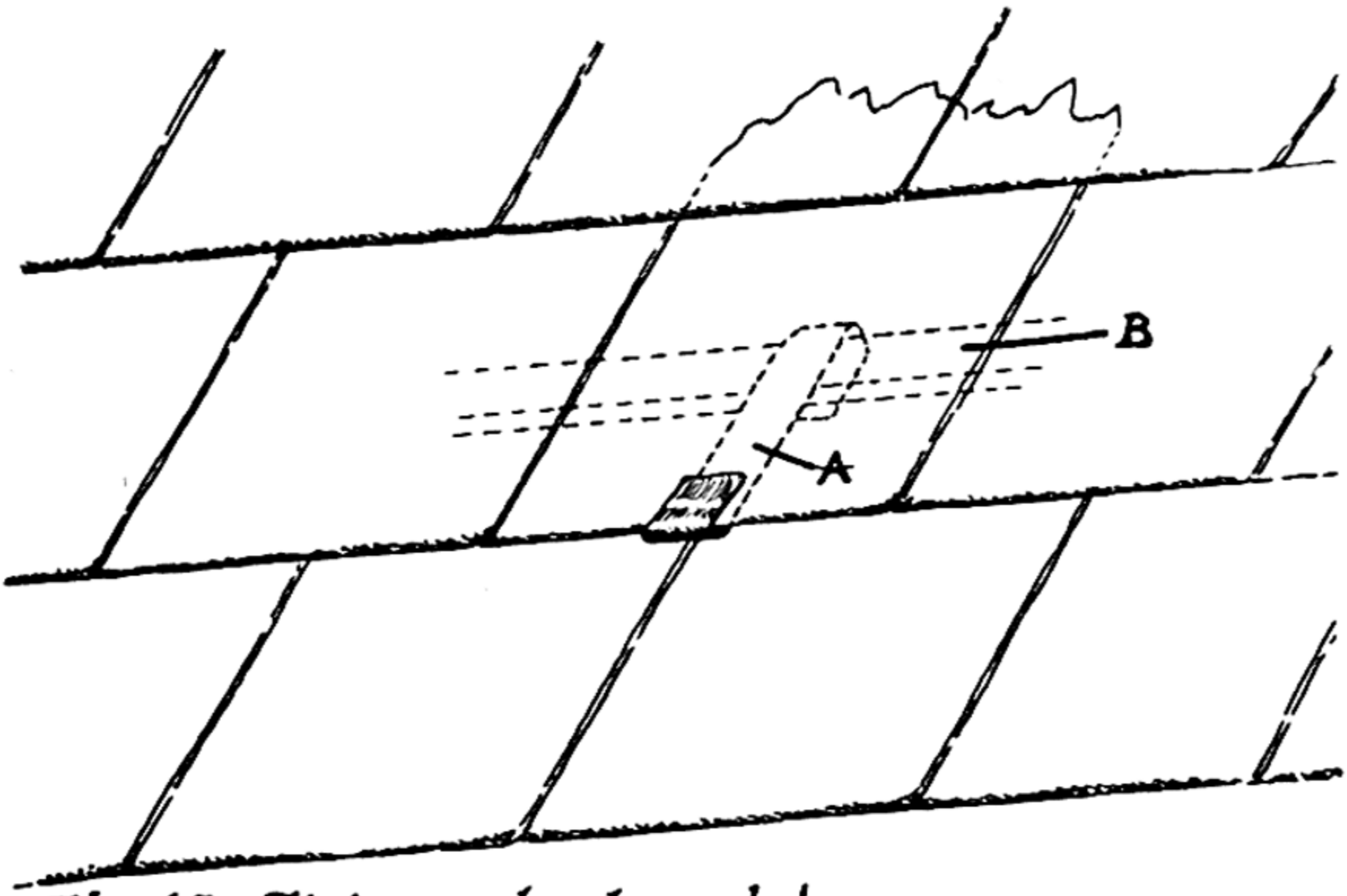


Fig. 45 Fixing a broken slate.
A strip of lead (A) is hooked over the batten (B) beneath

piece of zinc from the inside, but where a roof is underboarded the tile must be wedged from the outside and secured with white-lead putty as before. The obvious alternative—that of stripping, replacing, and nailing the tiles—is usually too big a job for the amateur.

Gutters and Eaves

The first essential should be the cleaning out of accumulated leaves, dust, etc., from gutters and heads of fall-pipes. For this job we require a small trowel, a chisel knife, dusting brush, an empty paint can or bucket of

1 gallon capacity, and a metal hook with which to attach the bucket to the gutter or ladder rungs, as convenient.

It will be better to work down-wind to keep the dust under control. If the gutter is fairly dry it should be left quite clean, free from rust and scale, and ready for immediate painting. Portions which are waterlogged present more difficulty. The mud is scraped out, and the water swept along to the nearest downspout, then, when dry, the gutter is properly cleaned and dusted out. In extreme cases the mud and most of the water has to be ladled out, and remaining water dried out with an old mop, but this is only necessary in isolated positions where a gutter slopes away from the outlet.

Rain-water heads and swan-necks which connect with the gutter require special attention. These are likely spots for the accumulation of rubbish, and at times, for birds' nests. Blockages at such points are cleared by the aid of a flexible cane or wire, after which, measures should be taken for the covering of spout heads and the filling (by plastering) of holes leading between walls and underboarding of eaves.

Two very good reasons for these measures are: (1) to prevent the formation of nests and so reduce risks of fire, and (2) to prevent the access of icy winds which contribute to the freezing up of water storage tanks indoors.

Now for those positions which are not easily accessible. Many of the modern houses, and a few of the older ones, have eaves which project a considerable distance away from the walls. The position is sometimes rendered more difficult by lack of wall space between window heads and overhanging eaves. In such instances, the only course is to place the ladder against the gutter edge, using a lashing and cramp (Fig. 11), or someone to hold the ladder whilst cleaning and painting inside the gutter. Keep the top edge of the gutter and ladder head quite

dry and free from paint, otherwise the ladder may slip sideways; hence the wisdom of securing by cramping.

Following the completion of the inside, the outside of gutters (and eaves) may be commenced. It is safer to rest the ladder head against the house wall and so avoid the slippery edges of a newly painted gutter. The more awkward positions overhanging windows are reached by the aid of a cross-piece secured behind the ladder head and lashed with a stout cord. A piece of timber long enough to project beyond the window opening, and about 2 inches by 1½ inches in thickness, is ideal for the purpose and may, at a latter stage, prove particularly useful when painting window-frames (Fig. 46).

Throughout the operations of cleaning and painting we would stress the importance of cleanliness and dryness. Metal work in particular should be chipped and scraped to remove all loose rust and scale, and should not be painted in damp or rainy weather. We would also point out the value of a good eye-shield during the preliminary scraping of outside of gutters.

It is common practice to use up the odds and ends of left-over paint for the inside of gutters, but it is unwise to include remnants of flat-paint from interior jobs. Such material is incapable of withstanding water and in some cases will actually induce corrosion. The quality of the paint is considerably improved by thinning with four parts of boiled oil to one of turpentine, and any of the following will form a satisfactory base for either first or second coating: Red lead, white lead, graphite, red oxide, black, or, as an alternative to oil paint, we can employ one of the ready-mixed bituminous paints for both coatings.

In all cases where these black finishes have been used on rain-water goods it is advisable to re-paint with the same type of bituminous compound unless we are pre-

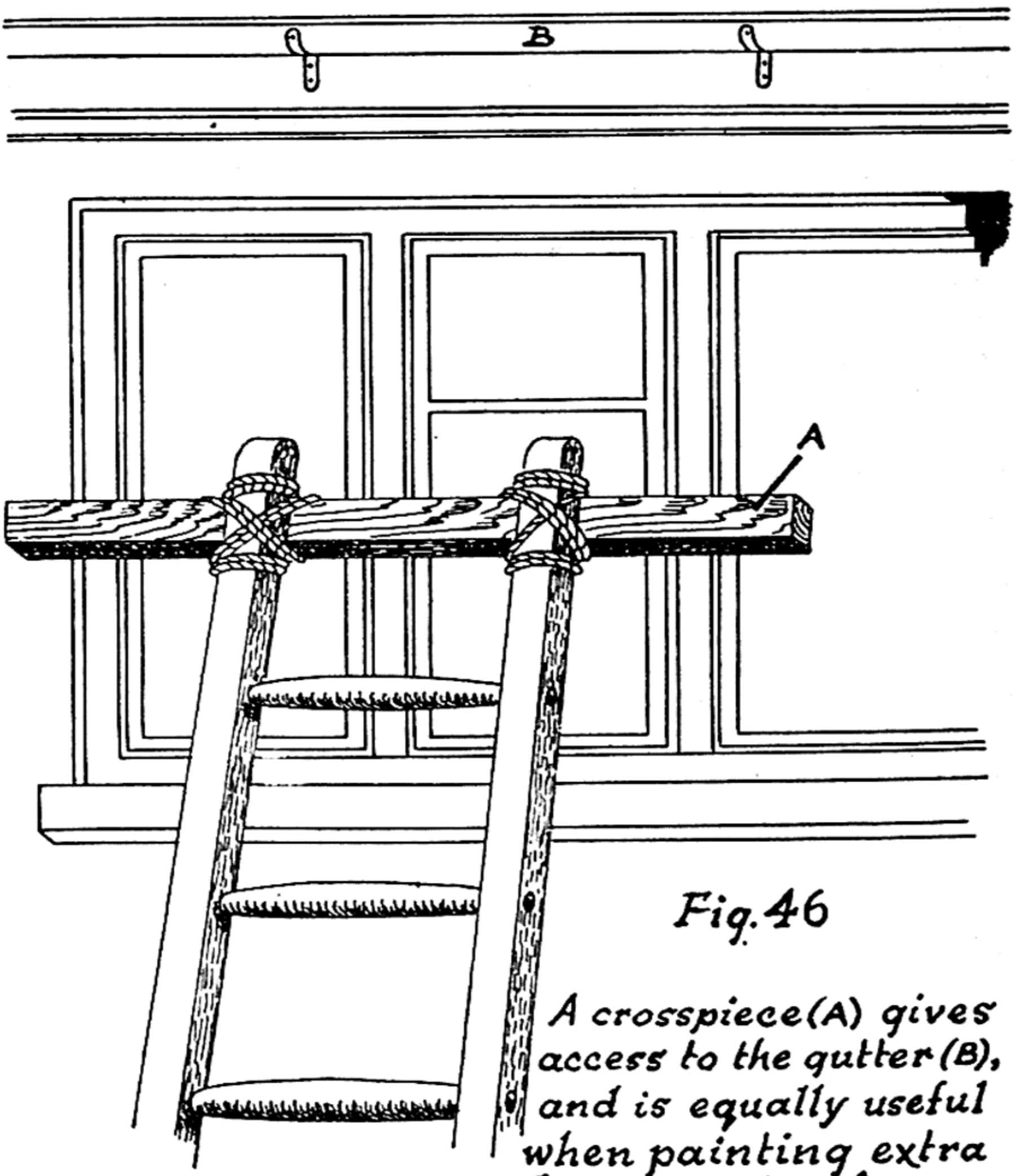


Fig. 46

A crosspiece (A) gives access to the gutter (B), and is equally useful when painting extra large window frames.

pared to render the surface inert by the application of a sealing solution (see p. 94).

It is a good plan to paint the underboarding of eaves in cream or other pale tint and thus gain a combination of colour contrast, and reflected light to the interior rooms. In a two-colour job we can save time and energy by using two paint kettles and brushes (one for each colour), applying the light colour first, and the dark shade afterwards, the whole involving one journey up the ladder. As each section is painted, the paint kettles are hooked upon a convenient rung behind the ladder, and are carried down when the ladder has to be moved. Defective joints of gutters can be repaired with white-lead putty when the first coat is dry.

Barge-Boards and Gables

This work calls for a good extension ladder with rope and pulley attachment. The operation is carried out in sections, commencing at the lowest point and gradually getting accustomed to the increasing heights. Work in two colours can be carried out as previously described, but only one colour at a time should be taken up the ladder. It is worth an extra climb to be free from all unnecessary encumbrances.

As a general rule it is wise to complete the first coating of barge-boards and underboarding before commencing to paint any half-timbered panelling. This latter job is commenced at the right-hand bottom corner, painting the panels and then the stiles on the right of the ladder. The ladder is moved about 2 feet to the left and another strip (from the top downwards) is completed, and so on until all is first coated.

When dry, the barge-boards are finished and then the panels below, leaving the half-timbered stiles until the panels are dry. The ladder head must then be padded

with a clean cloth to prevent damage when completing the stiles. A slight modification in procedure will be necessary if oil-bound distemper is employed for the wall panels. In this instance the panels are painted, and the stiles kept clean by wiping with a damp cloth, then, when the distemper is dry, the stiles are painted. The same method is adopted during first and second coating, but if the panels are unsatisfactory after two coats, a third coat is applied before finishing the stiles.

Rain-water Pipes

These and other fall-pipes are usually built up in lengths of 6 feet and, incidentally, provide a useful means of assessing the length of ladder required for painting. When properly fixed, they should be packed so as to stand well away from the wall and thus permit painting behind.

Preparation demands a thorough scraping, particularly behind the pipes, at points of junction, and at the base or shoe. Painting is carried out from the top downwards, using a 1½-inch brush for the main work, and a flat fitch for the oft-neglected parts behind. The head must be coated inside and out, and an extension ladder should be employed, otherwise it is almost impossible to see whether any part is missed. If the base of the pipe is below ground level, it will be necessary to remove surrounding soil to a reasonable depth, for such parts are especially liable to corrosion.

All work should be left smart and workmanlike. Splashes cannot always be avoided, but they can at least be wiped off adjoining brick or stonework whilst wet —the quicker the better, before absorption into the more porous material. In this connection, prevention is better than cure; a thin sheet of metal, or cardboard, can be held behind the pipe to protect the wall when painting; the result is well worth the trouble and should

eliminate unsightly paint smudges which are too often in evidence on adjoining walls.

Railings

Iron railings present similar problems to fall-pipes. Corrosion is usually more widespread, with blistering and scaling on the undersides and ornamental parts. The scraping of such work can best be done with a strong knife, preferably an old one, capable of withstanding hard wear. This can be supplemented by dry scrubbing with a strong wire brush until all loose material is completely removed. If this operation is well done, painting will give satisfactory service, otherwise corrosion will continue beneath the new paint, thereby reducing its efficiency.

The close proximity of soil or shrubs has an injurious effect upon paint, and any measures for the permanent removal of earth and pruning or clipping of hedges will give additional air space and ensure dry conditions, both of which are beneficial in effect. It is bad practice to wash ironwork in the usual manner, indeed, it is seldom necessary; any grease or grime should be removed by scraping and afterwards washed with a paraffin rag.

Final preparations for painting will necessitate attention to one or all of the following: (*a*) The removal of dust; (*b*) protection of walls or coping—an old sack, piece of timber, etc., will catch drips or splashes; (*c*) shrubs may need to be heeled over to give space for painting; this can be done with the aid of a plank, secured by stakes, struts, or ropes. In some cases a rope is all that is necessary to draw plants together whilst painting (Fig. 47).

It is a good plan to touch-up the more badly corroded portions with red-lead paint (see p. 94), then, when dry, to proceed with first coating of the most inaccessible

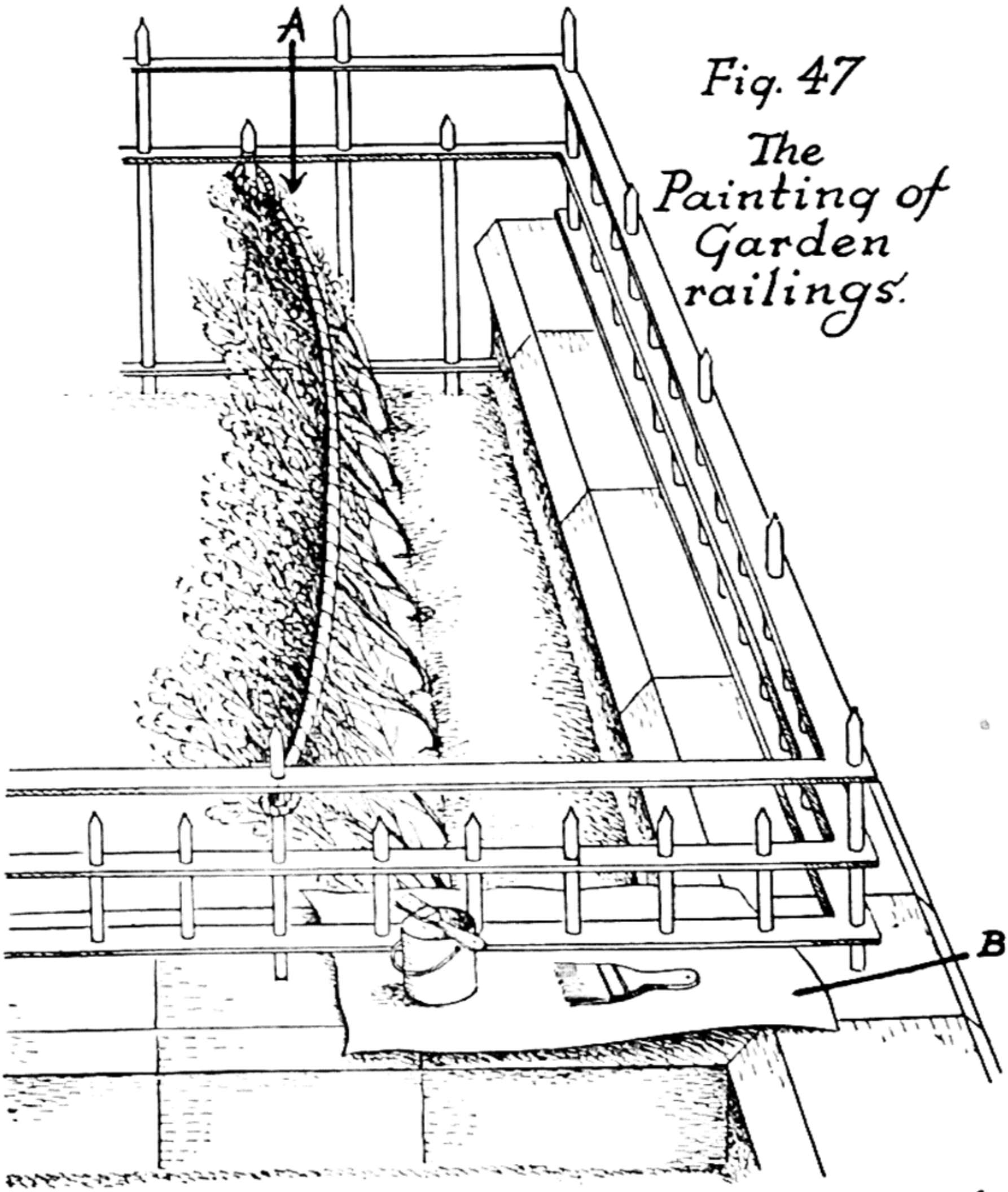


Fig. 47

The Painting of Garden railings.

A stout rope (A) holds shrubs out of the way, and brown paper (B) protects copings during the operation.

part—usually the side facing the garden. In the case of low rails it may be easier to reach the work by leaning over from the front side, otherwise it may involve standing in the limited space between rails and shrubs or, alternatively, reaching the work through gaps in the hedge: an awkward but necessary procedure.

A length of 2 or 3 yards can be painted in this manner and then, for a change—and rest—the front side of this area should be finished, commencing with the undersides, uprights, ornamental heads, and finally completing the horizontal strips. A 1-inch paint brush is suitable for the main work, and a flat fitch is ideal for painting beneath the lower horizontal strips. The chief supporting uprights should be finished neatly at the point of junction with the coping or other base. These parts, together with ornamental details, are coated rather sparingly to minimise runs (accumulated paint which runs or trickles down the surface). Runs cannot always be avoided, but we can at least look over the work at regular intervals and brush out such defects whilst the paint is wet.

Undercoats should be thinned to produce a semi-gloss paint which can be applied with little effort, but a finishing coat is glossy, more difficult to spread, and to ensure the best results should be applied more freely. In some situations it is advisable to display the warning: "WET PAINT," lest passers-by be given grounds for complaint *re* damaged clothing. In country districts, where railings form a boundary adjoining farm land, measures should be taken to prevent cattle from licking off the paint. There are several recorded cases of lead paint being removed in this manner with fatal results followed by legal action.

The treatment of wood railings is limited to (*a*) painting, or (*b*) treatment with a wood preservative. Much depends upon the condition of the surface; rough timber is

seldom improved—in a decorative sense—by applications of gloss paint, which accentuates the roughness and is comparatively expensive in time and material. Such work can be adequately protected by a coat of creosote or, alternatively, by one of the proprietary wood preservatives. Creosote is economical and can be renewed at intervals of three or four years to maintain its efficiency. The foregoing remarks regarding contact with earth should be observed, and it should be remembered that surfaces impregnated with coal-tar products form unsuitable grounds for subsequent painting in oil colour.

Creosote is applied with an old paint brush, giving a liberal coating to all parts and, in particular, to end grain. This material is liable to burn the skin, and, if a large area or trellis work is involved, the protection afforded by an eye-shield and old gloves is not to be despised. On completion, the brush may be cleaned by dabbing in paraffin and then washed with common soap and hot water.

Previously painted surfaces must be re-painted, but new timber of reasonable smoothness can be undercoated and finished to match the general colour of adjacent paintwork. At least two coats (preferably three), after priming, will be required to produce a satisfactory and durable finish.

Window-Frames

Certain preliminary jobs may require attention prior to the routine preparation of old paintwork. Windows may be stuck or difficult to open, sash cords may be broken, fittings corroded, panes broken or cracked, and surrounding pointing may need repairs.

All frames should be examined and defects put right. It is a common occurrence to find window-sashes stuck with paint. These can be loosened with a broad scraper

and screwdriver, working systematically around the edges until the frame is prised open. In some cases the treatment must be applied from inside as well as outside and, if an upper sash is involved, this must be held or kept fastened for a time until it has been ascertained that no cords are broken. The whole operation requires care, otherwise the parting bead which separates upper and lower sashes may be broken (Fig. 48A).

Window-frames which do not open and shut properly can often be remedied by the removal of accumulated paint (see p. 80). If this fails, the edges will have to be planed or otherwise reduced by treatment with a "Skarsten" scraper, or spokeshave—a job which, in the case of window-sashes, necessitates their temporary removal.

The preparation of old paintwork is the next operation, upper windows being completed before those below. In many cases it is sufficient to wash and rub down the old paint with waterproof glass-paper (No. 1½ grade), burning off the sills and broad flat areas where these are cracked, blistered, or in any way defective. It will be found that edges and rebates of movable frames collect most of the dirt and grime, and it is these parts which need particular attention when washing down.

The full extent of preparation required can only be decided by a survey of the work, and it will be found that paintwork on the north and east side will usually be in fair condition, while that facing south and west is likely to be defective (see "The treatment of old paintwork," p. 76). The stripping of loose putty can also be done at this stage, and, when all preparation is completed, windows should be cleaned, and pulleys and hinges oiled before painting.

Painting should follow the same order, top windows being tackled first. There are two methods of approach,

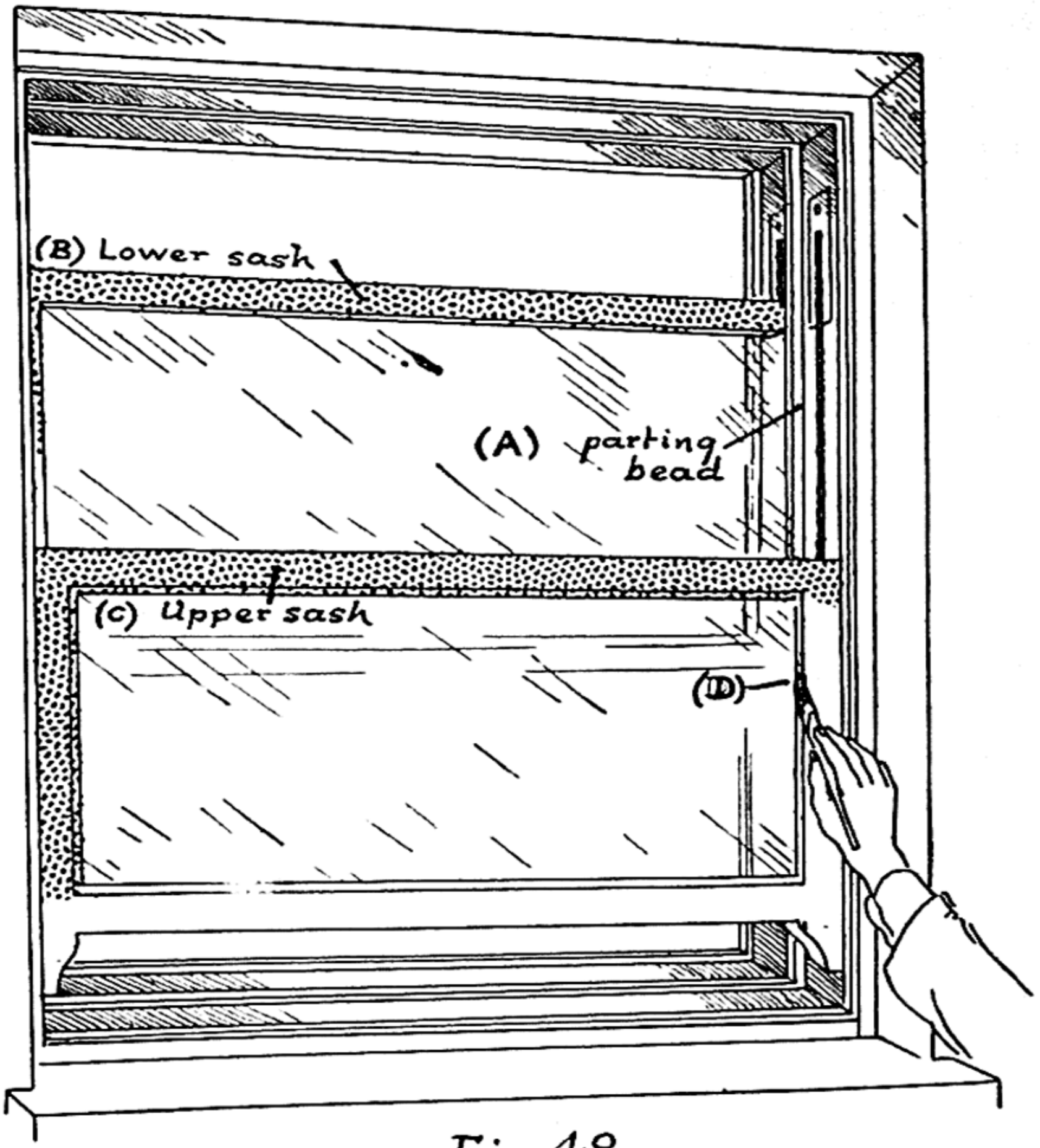


Fig. 48

Stage one in the painting of a window frame

The sashes can now be crossed, and the job completed.

one, involving the use of a cross-piece (Fig. 46), facilitates the painting of frames which cannot be reached from a ladder resting against the sill; in other cases a sill is wide enough to stand upon whilst painting, and in this event the ladder should rest against, and project above the sill in preference to the window side.

The procedure differs according to the type of frame, a sash window, for example, is fully opened, the upper sash being pushed to the bottom and the lower sash raised for painting. The whole is coated with a 1-inch flat brush, commencing with the raised sash (Fig. 48B), which is afterwards lowered to within 1 inch of the sill. Continue with the rebates and upper half of the frame (Fig. 48C) and remove paint from the portion of parting bead seen from the inside. Remaining work can be reached from the ladder, and dealt with in the following order: (1) top edge of upper sash; (2) upper sash (afterwards closed); (3) lower sash; (4) rebates and frame, and (5) the sill.

The most difficult part is the production of a perfectly straight line at the junction of putty and glass. This requires care, some practice and a part-worn brush, or flat fitch. The technique likely to prove most satisfactory is to dip the brush no more than $\frac{1}{2}$ inch into the paint, remove surplus colour by dabbing lightly against the sides of the paint kettle, then apply the material by a series of long strokes until a straight line is obtained. If the brush is fairly new it is advisable to use the edge, going over the same part three or four times until satisfactory. Any fine cracks between putty and glass can often be filled with paint, a job rendered easier by encroaching about $\frac{1}{16}$ inch upon the glass (Fig. 48D).

Windows of the hinged or swivel type are treated as follows: (1) Touch up badly rusted parts with red-lead paint; (2) remove all trace of lubricating oil from parts

to be painted. This can be done by wiping with a clean rag moistened with turpentine substitute; (3) paint all rebates and edges of frames which are seen from the outside (edges which open inwards are painted with the inside), applying the paint thinly to ensure hard drying; (4) close, but do not fasten, and complete the whole frame, working from the top downwards.

Upper windows of the casement type may prove rather inaccessible, but the upper parts of rebates and edges can be reached from the inside—a point to remember. Finally, all window-panes must be left clean and free from minute spots of paint, and windows should remain slightly open until dry.

Frames are frequently painted in two colours, the putty or movable parts being light, and the surrounding frame being finished in a darker colour. In such cases it is advisable to apply the pale colour first and allow this to dry before painting the dark areas. Popular colour combinations are: White and black; white and bright red; cream and black; cream and green; cream and brown; cream and blue-grey, and biscuit and bottle green. All are bright contrasts which produce harmonious schemes.

Greenhouses

Although these vary in size and shape the painting problems are much the same in all cases: it is the roof which presents the main difficulties. To gain access to the upper part will require one or more planks long enough to span the roof. Several iron brackets should be fixed, at intervals of about 3 feet, to the ends of the roof (Fig. 49A), to hold the planks in position.

A large house of the lean-to or conservatory type may require additional brackets at the centre. The lower ones are fixed, and planks laid across to form a working

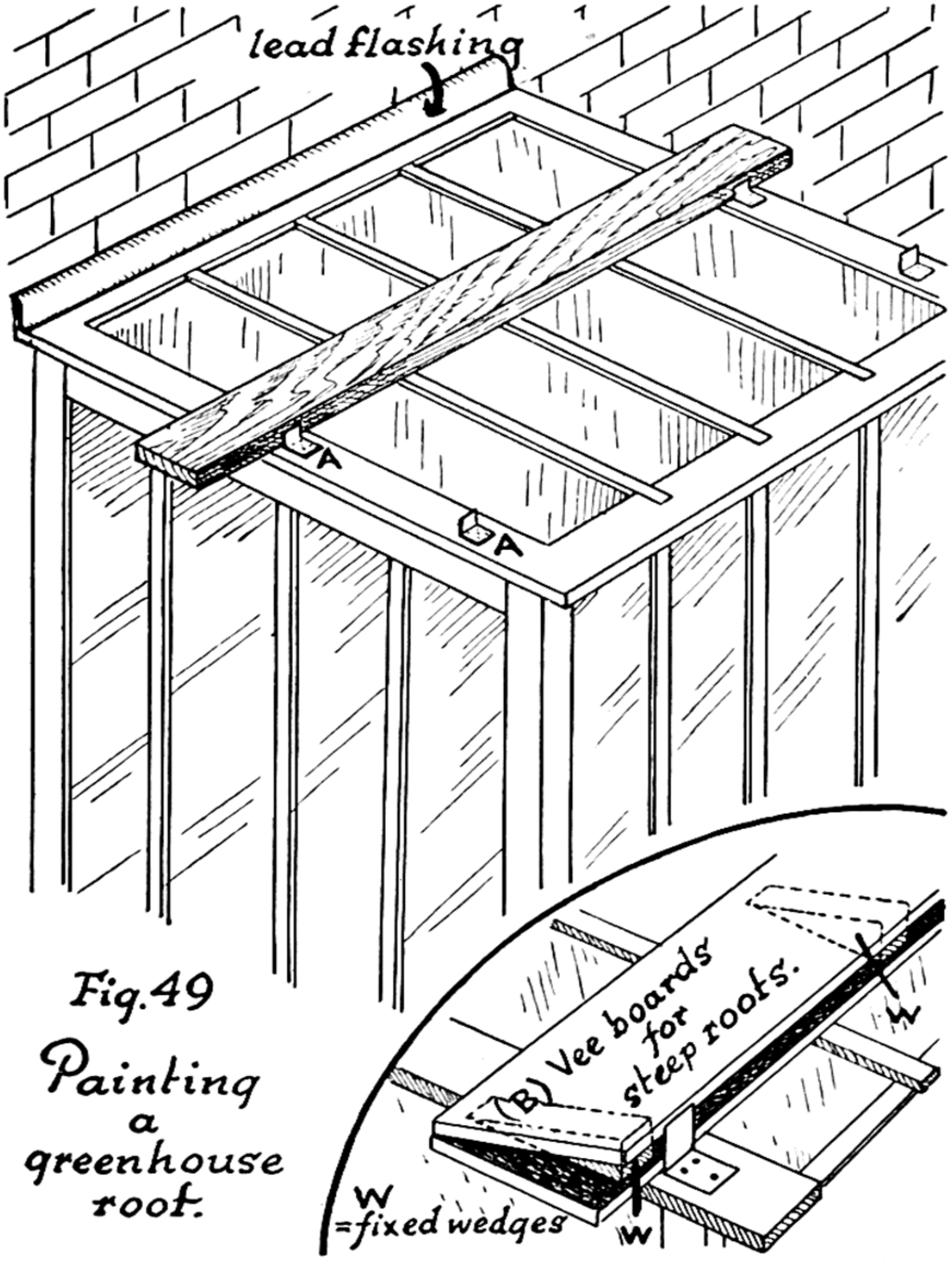


Fig. 49
Painting a greenhouse roof.

platform for the fixing of those higher up the slope. When all scaffolding is in position, painting is commenced at the top and continued downwards, removing each plank as work proceeds. As this operation must be repeated during the application of each coating, the brackets are also painted and left as fixtures.

To work upon a steep roof is uncomfortable at the best of times, but when this involves standing upon a sloping plank it is advisable to wear old shoes with thin soles and thus secure a better foothold. Other valuable aids are: (1) a long piece of floorboard laid against the upper edge of the plank, and (2) a " V " board constructed as illustrated in Fig. 49B. This latter device is strong enough to support a short ladder (held by an assistant) should this be necessary for the painting of work situated above a conservatory roof.

Doors

As preparatory processes, such as rubbing down, burning off, etc., have already been explained, we can, at this stage, devote more space to brushwork and the order of painting a door. The general procedure might be planned in accordance with the following specification of work to be done: Burn off; glass-paper; treat all knots; prime; stop; apply two undercoats and finish with one coat of gloss varnish: the whole to be executed in this order of sequence.

In painting a door the following method gives first-class results: Remove fittings, such as numbers, letter box, and/or door knocker at the time of preparation; paint the top right-hand panel, commencing with the angle between panel and mouldings and then the panel itself. For undercoating, the paint is applied rather sparingly and in all directions until evenly spread. Brush strokes must then follow the direction of the grain

—in this case perpendicularly—follow by "crossing"—*i.e.*, strokes at right angles to the first, and, finally, "lay off" (paint with the lightest strokes possible) in the direction of the grain.

Panels 2, 3, and 4 are coated in like manner (Fig. 50), then the mouldings, 5, 6, 7, and 8, in that order. Follow with the muntins 9 and 10; the cross-rails 11, 12, and 13; the door edge 14, and, finally, with the stiles 15 and 16. Avoid excessive accumulations of paint in the corners of mouldings and look over the work to see that no runs have occurred.

The importance of good brushwork and of suitable brushes is not generally realised. Good work should be comparatively free from brush-marks, and, if the job is executed with a 2-inch and 1-inch brush of average quality, fine work should result. Notice the behaviour of paint and brushes on the first panel. If the work appears coarse or ropy it indicates too much pressure when "laying off," the use of unduly thick paint, the use of a coarse or worn-out brush, "laying off" with a heavily charged brush (the brush should be almost dry during the operation), or spending too much time over the work.

To neglect any one of these conditions is certain to produce bad workmanship which can only be rectified by wet glass-papering. There is a fair amount of truth in the old painters' remark about "thin paint being good paint." Providing that the paint contains more turpentine than oil, a thin coating will rarely produce coarse work, and will require very little glass-papering between coats.

As a general rule only one edge of a door is painted with the outside, and that is the edge displayed when the door opens. If, for example, a door opens inwards, we paint the hanging (hinged) edge and, when painting the

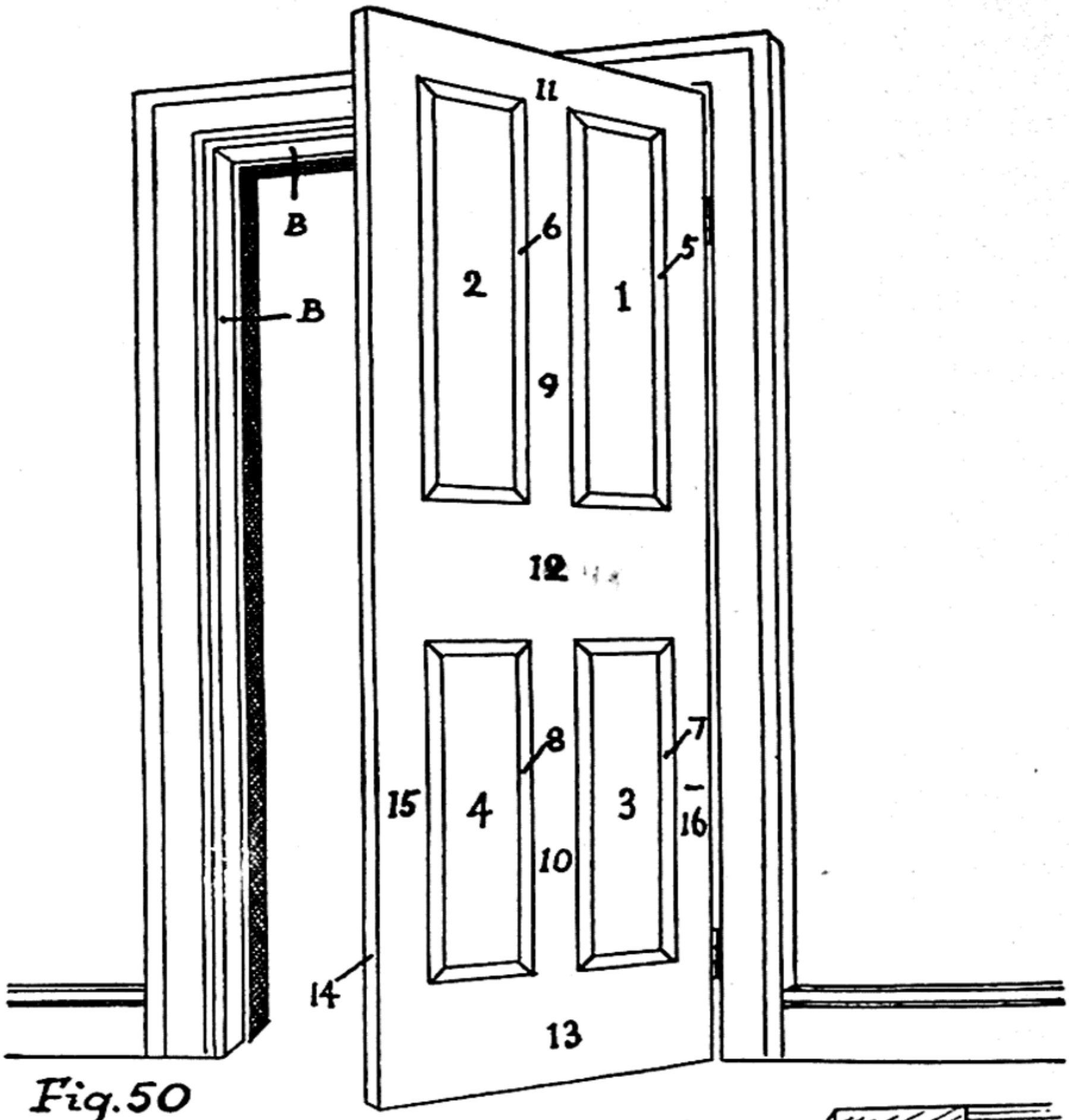


Fig. 50

A door is painted, one section at a time in the order indicated.
Avoid the defect (A)



The door easing, together with rebates (B), (B), are painted with the door, but the rebate on the hinged side is usually regarded as belonging to that side of the door.

casing, we include only one rebate, the upright to which the door is hinged. When a door opens outwards we paint the edge adjoining the lock and include all rebates except that containing the hinges. This, however, is entirely at the discretion of the individual concerned.

The main reason for painting a door edge before the stiles is to avoid the formation of a thick edge of paint upon the front of a door (Fig. 50A). If the stile is painted last, this bead of paint forms on the door edge. In any case it should be removed by a light stroke with a fairly dry brush, otherwise it remains soft and is liable to stick to the door casing.

All glass-papering must be finished before the application of the final undercoat. Wet glass-paper of the waterproof type will smooth a surface and level out runs and brush-marks far more efficiently than dry glass-papering, but whatever the type used it is necessary to avoid stripping the paint from sharp edges of moulds and stiles. Lastly, a wet rub down must be followed by sponging down with clean water to remove loose paint dust.

Varnishing

The actual application of varnish is exactly the same as that of high-gloss paints and enamels. The surface should be dry, smooth, non-greasy, and quite clean. Cleanliness must be observed in every detail; brushes must be clean and dry, the varnish tin equally clean, and even the atmosphere must be free from dust—obviously not a job for a windy day.

Technique is quite different from that employed in undercoating. Gloss finishes are of a comparatively thick consistency and, because of their glutinous nature, require part-worn brushes to facilitate application. The material should not be spread as for undercoating, but should be applied liberally and evenly, following the order shown

in Fig. 50. The work can be " crossed " and " laid off " as in painting, but with slow, forceful strokes. Brush-marks should float out and disappear within fifteen minutes, but runs are often troublesome until the varnish (or gloss paint) reaches the setting stage—*i.e.*, somewhere between a quarter and half an hour.

It is particularly essential to examine the work during this period. Runs can then be brushed out and any parts " missed " can be touched up. The defect known as " cissing " is a common occurrence during the application of gloss finishes. It presents a series of bare patches where the varnish has crept away from the underlying paintwork and can usually be detected within a few minutes of commencing work. This can often be prevented by wiping the unvarnished surfaces with a clean, damp wash-leather, but in bad cases it is necessary to give a brisk wipe down with fuller's earth sprinkled upon a damp sponge. The parts already varnished can be brushed at intervals until the defect is eliminated.

Unpainted woodwork is prepared as specified (see p. 89) and then coated with outside varnish thinned with 25 per cent. turpentine or, if available, with a special undercoating varnish. In about three days' time this can be rubbed down lightly with No. 0 waterproof glass-paper and re-varnished, but the varnish must be applied rather sparingly. The process is repeated after about a week, giving a good liberal coat of full gloss finishing varnish. The brushes, when not in use, are stored in a clean jar containing linseed oil: paint brushes being kept in water.

PART II

INTERIOR WORK

CHAPTER IV

INTERIOR DECORATING

Order of procedure: the treatment of ceilings.—Preparation and finishing of all types of surface, in paint, flat-paint, distemper, wallpaper, etc.—The treatment of dampness, new and old plaster, asbestos, plaster-board, and match-boarding.

How and Where to Begin

The painting and decorating of an occupied dwelling can be carried out in an orderly or chaotic manner according to the efficiency or otherwise of the initial planning. There is much to be said in favour of re-decorating one or two rooms each year, and, by keeping to a rota, the house is maintained in excellent condition and is never disorganised for long periods. This would appear to suit the amateur far better than to tackle the whole house in one prolonged operation.

What to do first depends upon the extent of the work involved. If, for example, we intend to decorate the whole house, a sensible order of procedure would be to commence on the top floor, completing the rooms one by one and working downwards to a convenient exit on the ground floor. The decoration of the main bedrooms and living-rooms should be completed before bathrooms and sculleries, the latter being in frequent use for the supply of hot water, the washing of brushes, and other essential jobs.

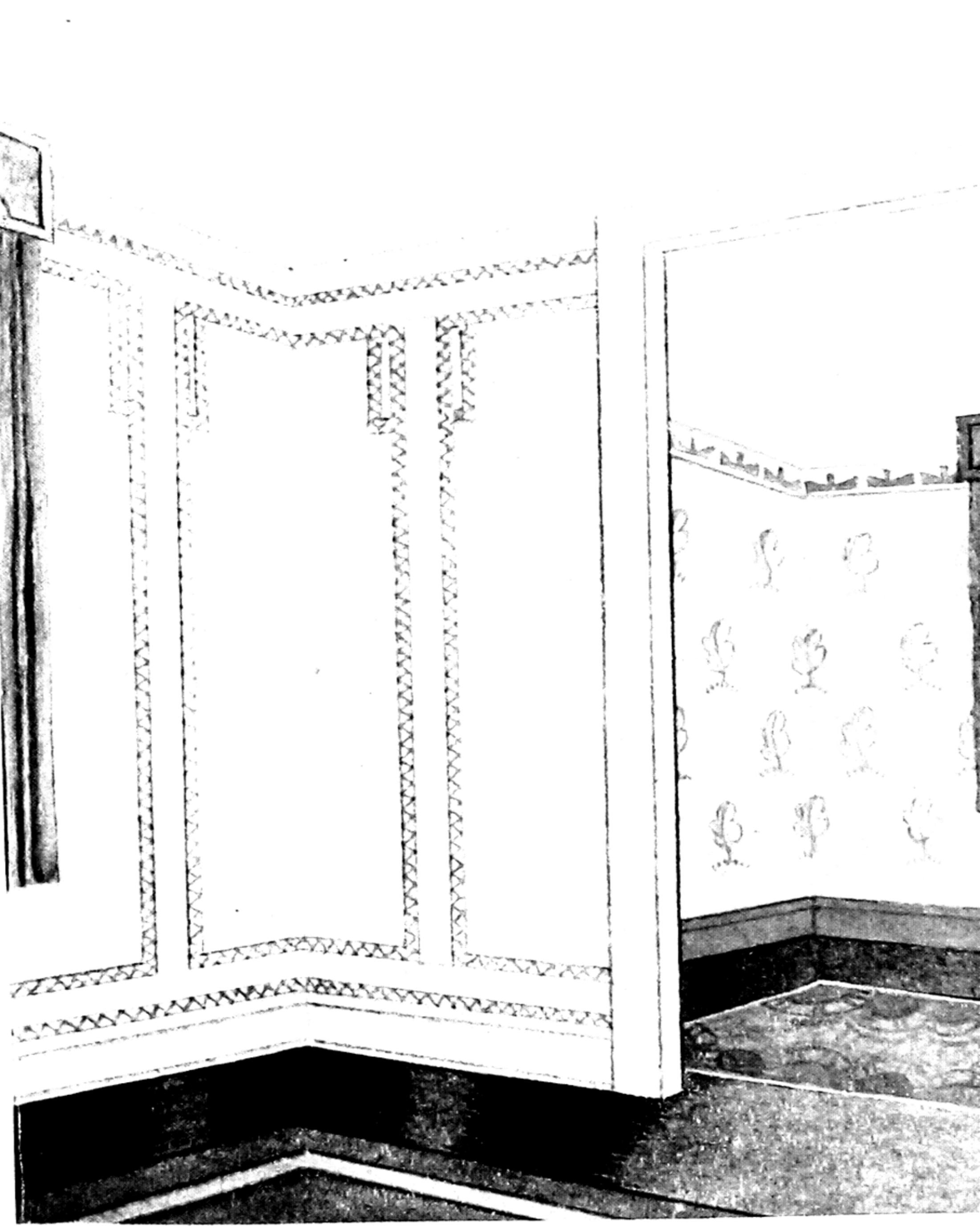
The staircase and hall should never be completed until the main rooms are finished. It is an advantage to do the preparatory work and perhaps to complete ceilings and friezes, but until all movement of ladders, planks,

etc., from room to room is over, there is no point in completing the walls and woodwork of this, the main thoroughfare of a house.

The chief aim when planning the order of sequence for a house or room should be the elimination and control, at the earliest possible moment, of dirt and dust. All preliminary work involving washing down, the stripping of wallpaper, repairs to plaster, and the distempering of a ceiling, should be completed, and the floor washed, before other parts of the work are finished. We should, as far as possible, arrange for each job to be done at the proper time and thereby reduce the possibility of splashing or damaging any finished work.

This does not imply that all rooms on the top floor can, or should be, washed down simultaneously; on the contrary, one room at a time is quite sufficient for any beginner. Certain routine measures for the protection of furniture and fittings must be taken at the very beginning. Small articles of furniture, as well as carpets, pictures, curtains, electric light shades, etc., should be moved into adjoining rooms, cupboards need to be emptied and large pieces of furniture protected with paper or dust sheets.

Having made these preparations take a final look round to see what else can be done. This is an ideal time for getting the chimney swept, for carrying out alterations to electric wiring, plugging walls in readiness for new mirrors or pictures, repairing the fireplace, etc. A polished mantelpiece is not difficult to remove and if this can be done the papering of walls will be simplified. Finger plates and any valuable fittings should be removed from doors, chromium switch plates taken down and, if there are children about, a temporary plate can be made from Bristol board to prevent accidents. Polished floors are usually protected with paper or dust sheets;



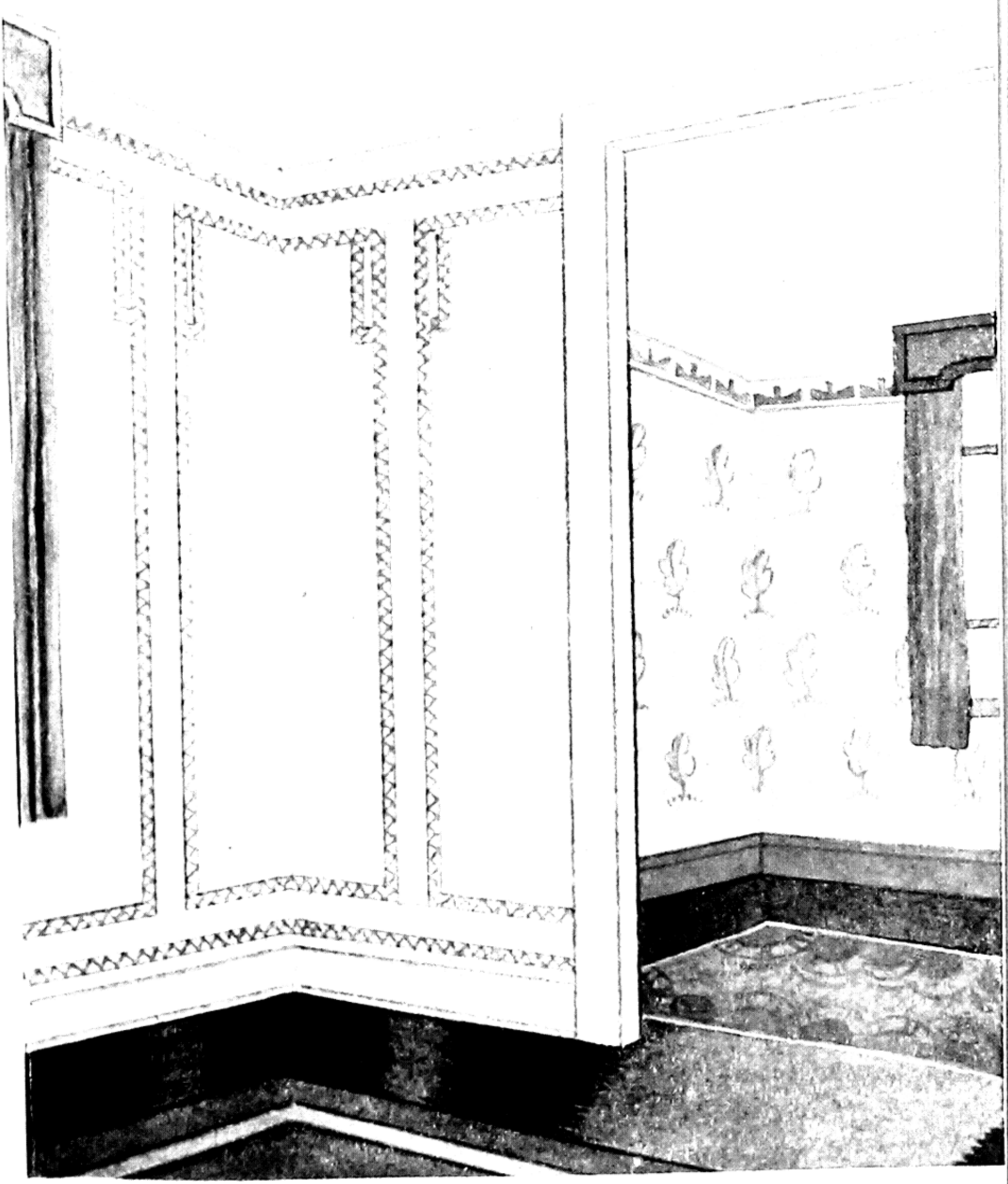
FIGS. 96 AND 97.—TWO BEDROOMS (*see p.* 278).

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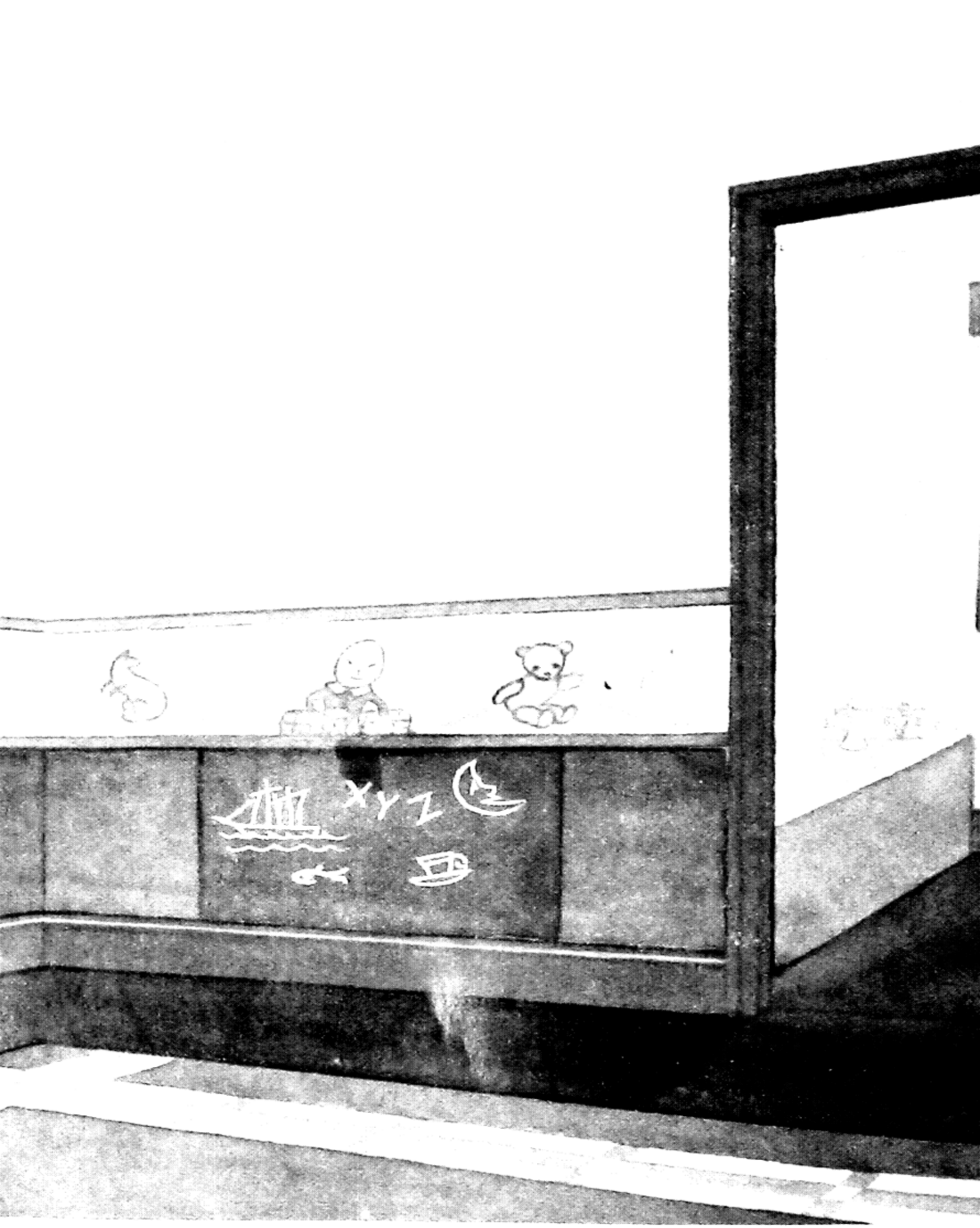
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FIGS. 96 AND 97.—TWO BEDROOMS (*see p.* 278).



FIGS. 98 AND 99.—NURSERY AND BATHROOM (*see p.* 286).

any carpets in the staircase and hall should also be protected or taken up. Time spent in preparation should never be regarded as time wasted. It ensures greater freedom in the execution of a job and adds considerably to ease and comfort in working.

Ceilings

A nicely finished ceiling is essential to the success of any decorative scheme. It forms the largest and most conspicuous surface in a room, and any defects remain very much in evidence. Because of its position and area a ceiling cannot be renovated without the exercise of physical effort; there is no easy method, but we hope that the following suggestions will lead to better results and minimise the risk of failures.

What material to use is entirely at the discretion of the individual. We can select any one of three types of distemper and apply this directly upon the surface, or upon a white lining paper. Patterned ceiling papers are equally popular and, when some skill in paper-hanging has been acquired, there is a wide range of embossed material from which to choose. Plastic paint (see p. 165) is also used to obtain low-relief pattern comparable with other embossed papers, but without joints. Gloss paint is quite unsuitable for ceilings; it induces condensation and accentuates inequalities of surface, but flat (dull) paints are free from these shortcomings and produce a perfect and even surface. Now for a detailed survey of the pros and cons of each.

Ordinary distemper is available as a white or coloured paste as well as in powder form, both of which are thinned for use with water. The main body or bulk consists of whiting (chalk), and the fixing or binding material is dilute glue or glue-size, hence the descriptive name size-

or glue-bound distemper. To mix this type is a simple, straightforward job, within the capacity of any beginner (see p. 150).

Because of its low price, speed of application, and light reflecting capacity, it is widely used for ceilings, friezes, and the upper parts of walls. It is not suitable for positions within reach of children or for those parts of walls liable to come in contact with clothing. It is readily soluble in water and can be removed when re-decoration becomes necessary. It provides a means whereby work can be finished in one coat and, upon a dry, porous surface, will remain in good condition for some years.

The main disadvantages are: (1) that time saved during the first application is more than offset by the time and trouble involved in washing off—a very necessary preliminary to re-distempering; (2) a second coat cannot be applied upon an unsatisfactory first coat; (3) it is almost certain to be damaged by condensation if applied directly upon painted, varnished, or other impervious surfaces; (4) size-distemper should never be used for the treatment of embossed patterns; it fills up the hollows, destroys the sharp contrast of light and shade, and is difficult to wash off.

Oil-bound distemper is a proprietary material containing a waterproof emulsion prepared from glue and linseed oil. Although it is really washable in the sense that it cannot be removed by washing, this does not imply that old surfaces can be cleaned by this method. Much depends upon how the distemper is mixed. Some manufacturers supply petrifying liquid, a special thinner which improves the waterproof properties and, incidentally, may save one coat when working upon new plaster work.

Two coats will usually give satisfactory results upon surfaces previously finished in similar material. Since

the drying speed is less rapid than that of ordinary size-distemper, the oil-bound type is more easily and leisurely applied; it is not so obviously discoloured by slight dampness and does not destroy the sharpness of embossed patterns. Because of these properties it is widely used as a temporary decoration upon new plaster (and Portland cement) surfaces.

The possible disadvantages are: (1) this hard-drying material cannot be employed directly upon oil paint or varnish; this procedure would result in the development of surface cracks; (2) repeated applications of any material which cannot be stripped off, must eventually result in chipping or flaking.

Washable distempers include a number of first-class oil-bound distempers, some inferior grades and some which contain fixatives other than oil emulsions. The term washable distemper is altogether unsatisfactory because it gives no real indication of the type of binder employed. Many of these compounds are semi-washable—*i.e.*, after prolonged soaking they can be removed by a combined operation of scraping and washing—a task calculated to test our patience.

These materials usually produce a satisfactory finish after two coats; they are well bound—*i.e.*, do not rub off like size-distemper, yet there is some danger of chipping if subsequent coatings are superimposed without stripping the old material. If a really washable distemper is required, it is better to obtain some well-known make of oil-bound distemper along with the appropriate petrifying liquid.

Paper-hanging is a comparatively clean process which facilitates the hiding of stains and cracks. This job obviously requires some practice, but one should gain preliminary experience by commencing operations in one of the smaller rooms. It is advisable to start with plain

lining paper or a semi-plain (mottled) ceiling paper before tackling the more difficult task of matching patterns (see p. 176).

This treatment can be extended to include a centre panel of patterned paper and a surround of plainer material with a narrow border between, the only disadvantage of this arrangement being the necessity for stripping, before re-papering in the ordinary way. Normally, one can apply two papers without stripping.

Flat-paint is often regarded as an expensive luxury—a conclusion based upon initial costs only. If we take a long-term view of material and labour costs, it will be found that this treatment is more economical than papering and approximately equal to decorating in oil-bound distemper. The painting of new plaster surfaces necessitates at least three and probably four coats and, as the material is about the same price as a good oil-bound distemper, the first cost is relatively higher.

Subsequent painting is a straightforward operation involving very little effort and expense. The surface can be washed clean in an hour or two and sometimes the result is so good as to render immediate painting unnecessary; at other times, one coat is quite sufficient. A cracked and repaired ceiling involves an extra coat, but this is equally necessary in the case of oil-bound distemper. Lastly, flat oil paint can be applied coat upon coat without chipping or flaking.

Distempering

Preparation can make or mar the finished work and, if properly carried out, can ease the application of distemper. The object should be the production of a surface presenting an equal degree of porosity, dryness, cleanliness, and freedom from injurious chemical influences

such as arise from badly stained ceilings. Defective plaster must also be made good and, in old houses, sagging ceilings should be repaired.

New Plaster presents few problems, the surface being clean and dry. Any fine cracks will usually be filled and disguised when distempering, but larger defects should be saturated with clean water and filled with plaster of paris or Keene's cement. To retard its rapid-setting property the former should be mixed with dilute glue-size; one of size to twenty parts of water is quite effective.

The first coat of size is usually prepared some hours before use, to give time for cooling and setting. Glue-size can be purchased in jellied form, or as cake glue (carpenters' glue), or in powder form. The latter is termed concentrated size and is the most widely used variety. It is prepared as follows: have boiling water in readiness; take a clean pail and stirring stick, and mix ½ lb. of concentrated size with sufficient cold water to form a creamy paste; stir until free from lumps, and immediately add up to 1 gallon of boiling water, stirring briskly for two or three minutes. Cold water can now be admixed to make up 1 gallon of size.

Size varies considerably in strength, some makes being noticeably stronger than others. There are, however, instructions on the packet, and, when the jelly is set, final adjustment can be made to reduce the mixture to a brushing consistency—usually in the form of a trembling jelly. If the size is too stiff it should be warmed for a few minutes until liquified; at this stage it is readily thinned with cold water. Notice the total amount required to reduce the size, and make a note for future reference, but remember also the brand of size employed. Finally, introduce 1 lb. of whiting, previously mixed with water, to impart a little colour to the compound.

This mixture (termed claire-colle) is applied with a

distemper brush to the area already prepared. It works easily and smoothly, and there should be no difficulty in applying an even coat, but on no account must any part be missed, otherwise the finishing distemper will be paler in colour.

To Mix Distemper sufficient for 20 square yards place 5 lb. of whiting in a clean pail, cover with cold water and allow to stand until thoroughly soaked. In the meantime prepare ¼ lb. of concentrated size in a separate pail. Pour off any surplus water from the whiting and mix to a smooth batter-like consistency, adding more water if required.

To tint the mixture it is necessary to add the desired lime-resisting colour (see p. 277) after this has been ground upon a palette board, with size or water as diluent. Mix well, and test for correctness of colour by drying a little distemper on a scrap of paper. When satisfactory, add the warm size in the proportion of one of size to two parts (by volume) of stiff distemper; stir well, and then strain through coarse muslin or, better still, through a wire gauze strainer (Fig. 41). When cool, the mixture should resemble thick cream and in this state—after stirring well—it can be applied smoothly and evenly.

Note.—Dry colour must be well ground in water (or size) before admixture with distemper, otherwise dry particles will cause unsightly coloured streaks during application.

Applying Distemper

There are four important points which demand our attention during any distempering operation. First, see that furniture is adequately protected; then arrange a suitable means of access to enable work to proceed rapidly —two step-ladders and a plank form the usual scaffold;

close the door and window to prevent too rapid drying, and, finally, have ready some clean water and a floor cloth for the removal of splashes.

Commence distempering on the side nearest the window and work away from the light. This enables the work to be seen more clearly, especially on a sunny day when the glaring sunlight is exceptionally powerful. The ceiling is coated in a series of strips some 3 feet in width, commencing at the angle between ceiling and wall, and then working from right to left in an effort to join the previous strip before the edge dries.

Distemper is not crossed and "laid off" as in painting; the material dries far too rapidly for that. Instead, it is applied liberally, with long brush strokes in all directions. The work should proceed non-stop and as quickly as is consistent with the application of an even coating. Above all, see that every part is covered; there can be no re-touching of bare places when the ceiling is finished. The angle between ceiling and cornice or wall should be finished neatly with the least possible overlap. Lastly, admit fresh air to ensure rapid drying, and remove splashes from walls, woodwork, and floor. If the job is not satisfactory it must be washed off and re-done from the very beginning. To apply a second coat would disturb the first; the ridges and thick patches thus formed would appear worse than the first effort.

Surface Preparation

Old surfaces are widely varied and demand equally varied treatment before they can be distempered. Dampness must be cured at the source and the affected part given ample time for drying out. Old distemper must be washed off with warm water, dealing with one strip of ceiling at a time. It will be found that the distemper comes off quite easily as clean water is brushed

over the surface, and with each dip into the pail the brush is automatically cleaned. By repeating the process and using frequent changes of water the bulk of the old material can be removed. There is no point in attempting to scrub the surface, but a light sweeping motion with the side of the brush is helpful.

It is not generally realised that the surface must be washed clean—*i.e.*, right down to the bare plaster. This can be done by brush washing, but is more easily and quickly accomplished with the aid of a suitable swab or, better still, with a sponge. If the ceiling is to be hung with lining paper, or finished in oil-bound distemper, it is absolutely essential that every scrap of the old material is removed, leaving the surface entirely free from loose, powdery material. In this case, all angles and corners must be scraped with a chisel-edged piece of wood.

Plaster cornices should be washed with a small paint brush, and all angles cleaned out with pieces of wood of suitable shapes and sizes. Great care must be taken because saturation with water softens the plaster and in this condition it is easily damaged. Cornices should always be primed with white-lead flatting (white lead, turpentine, and driers) before the first application of distemper. This treatment keeps the plaster hard and facilitates subsequent washing off.

Stains have an unpleasant habit of showing through the new distemper. This is due to chemical action and, to effect a cure, the part must be painted with flat-paint, oil-bound distemper, or with a thin coat of white knotting (equal parts knotting and methylated spirit).

Sagging Ceilings can often be remedied by simple methods. If the defect occurs in an upper room it may be due to a broken strut linking the ceiling joist and rafters. This is quickly ascertained by a brief examination in the roof area. Should this prove to be the case

it is necessary to shore up the ceiling from below (Fig. 51) whilst the damage is made good.

Shoring is also necessary when repairing a broken ceiling joist. In this instance the ceiling is jacked up as previously described and the broken part spliced by nailing splints on either side. Suitable dimensions for the latter are 4 feet by 3 inches by 1½ inches, the timber to be sound and straight grained.

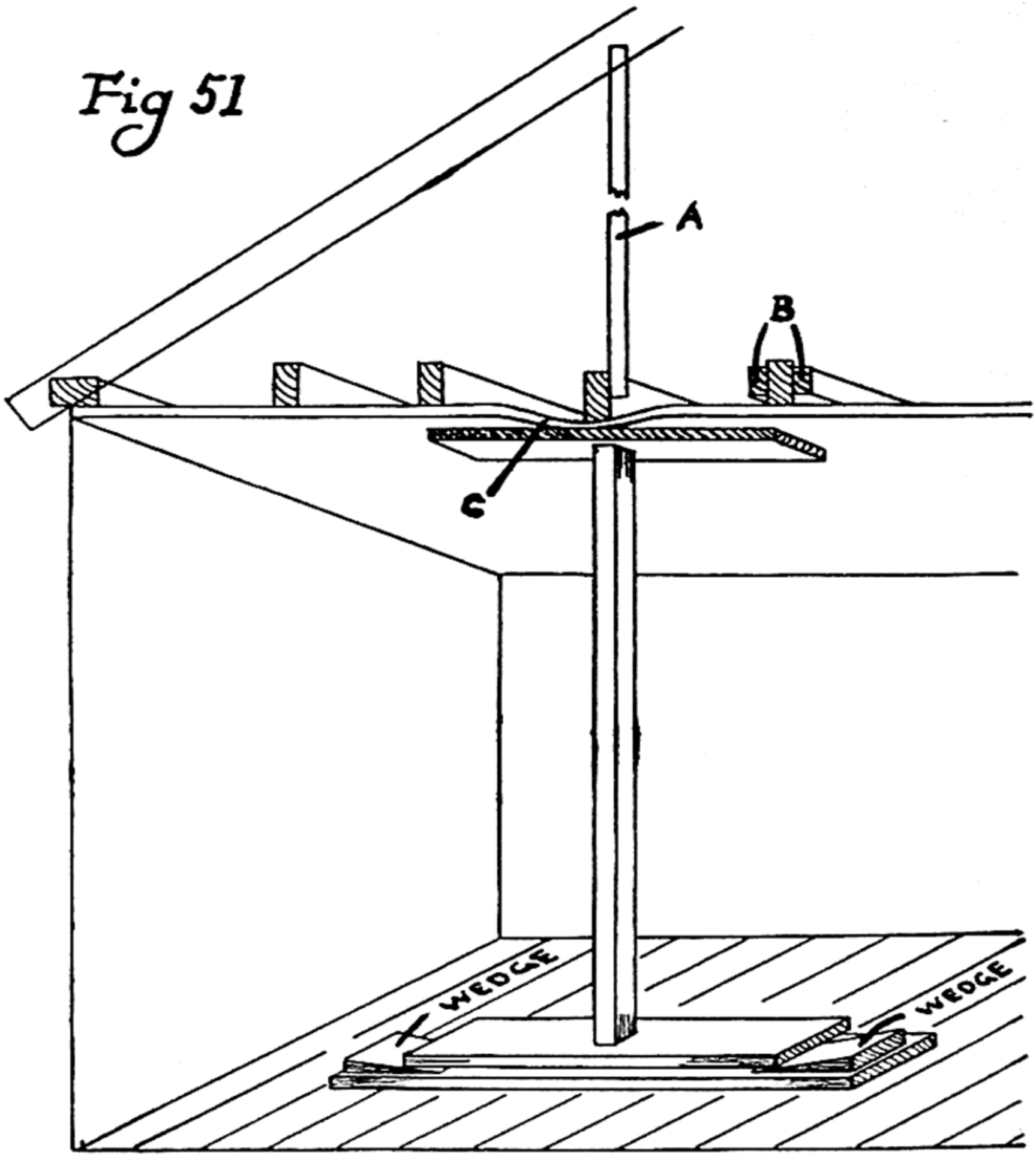
The sagging of ground-floor ceilings may be due to lack of adhesion between plaster and laths, between the surface coat of plaster and underlying mortar, or to broken laths; the latter being the more rare occurrence. It is sometimes possible to identify the real source of the trouble without stripping off the plaster. If the sagging portion can be lifted to its original position by hand pressure, it may be possible to effect a satisfactory repair by fixing to a convenient joist; the latter can be found by piercing the ceiling with a bradawl. Fix with screws and small washers, countersunk below surface level.

Plastering

Should the foregoing methods prove unsatisfactory, we must adopt the more orthodox procedure of chipping off the defective plaster and starting afresh. Proceed along the lines specified under the heading *Wall Repairs* (p. 56), but in this instance Portland cement must be replaced by Keene's cement when mixing the hair mortar. Rake out the old mortar from spaces between laths, otherwise there will be no key for the new plaster. Broken laths should be bared to the nearest joist, cut out (Fig. 52), and replaced with sound timber.

The patch needs a thorough wetting before binding down the edges with mortar. When dry, mix cement and sand in proportion 1 to 3, and add a little hair to assist adhesion. The first coat is applied with just

Fig 51



Repairing a broken strut (A), or splicing a broken joist by means of splints (B) involves the temporary shoring of the sagging area (C)

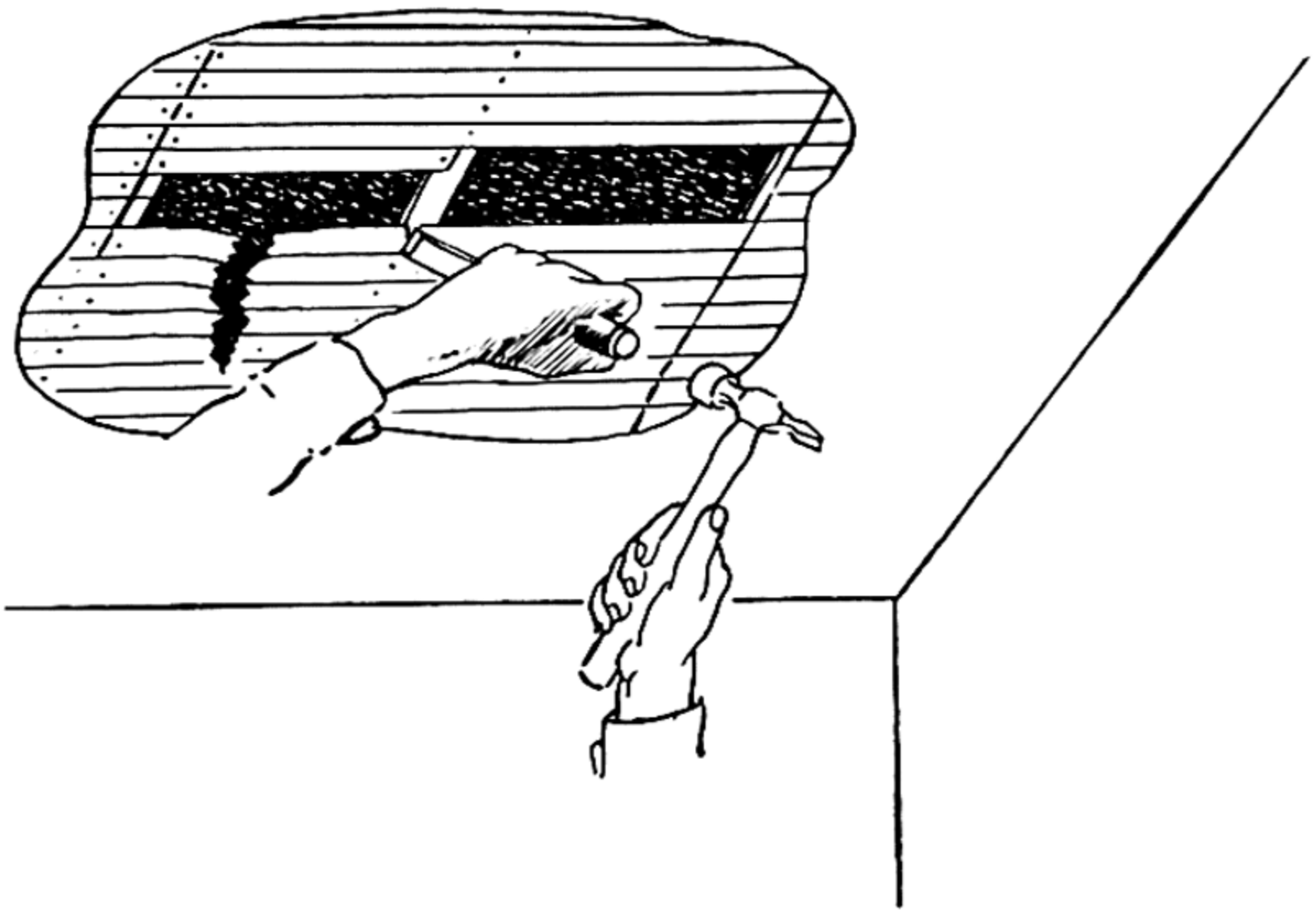


Fig. 52

Cutting out broken ceiling laths at the nearest joist.

Replacements should be fixed about ¼ inch apart.

(A) Illustrates a home-made laying trowel particularly useful for ceiling repairs.

enough pressure to force the material between the laths and leave a surface covering of about $\frac{1}{4}$ inch; this to be left rough, but not scratched. When dry, apply a second coat, leaving this as level as possible and about $\frac{1}{10}$ inch below the surrounding surface; allow one hour for setting, and then provide key by scratching.

At least six hours should elapse before the application of the "skimming" or surface coat. This may be Keene's cement alone, or a mixture of one part plaster of paris to three parts of slaked (or hydrated) lime. Mix with water until a smooth creamy paste results and apply immediately. The laying trowel (Fig. 14), or substitute (Fig. 52A), is a real asset during this levelling operation; it shows up the hollow places and reduces ridges. Finally, when the plaster is set, the surface is brushed over with clean water and trowelled in all directions until quite smooth. A repair of this nature will obviously require several days in which to dry out before decorating.

To repair a badly cracked ceiling is no easy task, especially when the edges are out of plane (Fig. 53A). Normally, the crevice would be raked out and edges undercut (Fig. 53B) to hold the stopping in place, but this method cannot disguise a difference in levels for the simple reason that a bevelled repair not only accentuates the light and shade effect but is almost certain to crack along one edge.

The remedy demands courage, and consists of cutting into the plaster to form a channel of 2 to 3 inches in width, the wider groove producing the more shallow and, in consequence, less noticeable repair (Fig. 53C). It is better to cut out the whole thickness of plaster, right down to the laths, and to fill the cavity with hair mortar and a surface skimming, as previously described. This helps to bind down the edges, thus reducing the risk of subsequent cracking. Following the completion of plaster

repairs, the ceiling may be treated as specified for new plaster or, to give a really good finish, the surface can be glass-papered, coated with size (not claire-colle) and covered with white lining paper (see " Papering Ceilings," p. 167). This forms a good base for any type of dis-

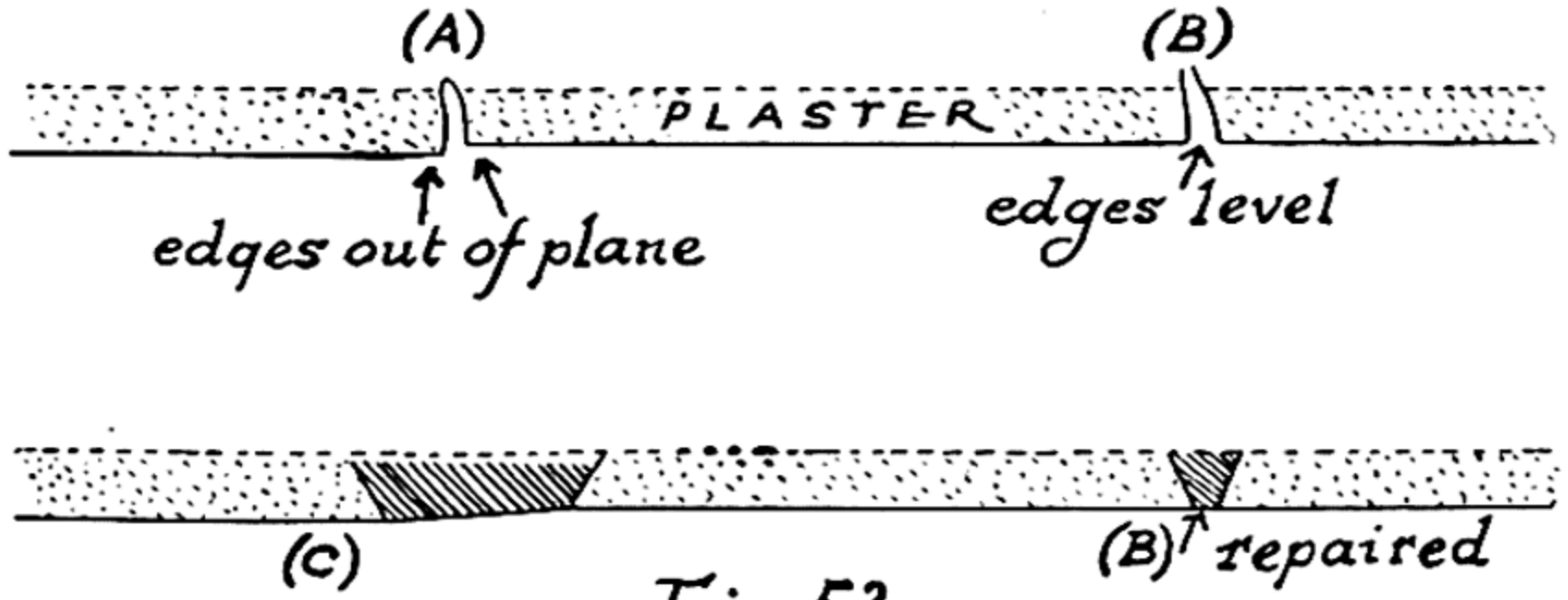


Fig. 53

Cracked plaster work should be under-cut and repaired as in (B), but when edges are not level (A) the work is executed as in (C).

temper or paint and, if distempered, requires one coat only.

Distempering of Patterned Paper

To apply any type of distemper upon an old ceiling or wallpaper is always a risky business, the chances of success or failure being about equal. If the paper is firmly attached and the pattern is pale in colour, the job is worth a trial. To coat the surface with claire-colle costs very little and will give a fair indication of the suitability of this treatment. Some blistering or buckling of the paper is to be expected but, with the drying of the size, the paper shrinks and generally resumes its normal appearance.

Should the edges or joints become loose, or blisters fail to disappear, it is unwise to proceed further, but if only one or two edges lift, these can be pasted down and, when dry, the job may be distempered. A washable distemper is always preferable for this type of work; if one coat dries "patchy," additional coatings can be given. On the other hand, size distemper is very limited in this respect. Another point for consideration concerns the subsequent stripping of the paper. A washable distemper should be rendered less waterproof by thinning with water only (not petrifying liquid), to facilitate the penetration of hot water where removal becomes necessary. Size distemper can be used directly upon washable distemper but not vice versa.

Applying Washable Distemper

The successful application of these materials depends almost entirely on the thoroughness of preliminary preparation. The painters' saying that "good work involves 90 per cent. preparation and 10 per cent. application" is particularly true where washable distempers and wallpapers are concerned. Each demands a firm base, entirely free from dust, dirt, or powdery material likely to prevent perfect adhesion. In each case, surface requirements are almost identical, and preparation should follow the same general lines.

New Surfaces

These include plaster, plaster-board, asbestos, compressed or laminated board and, in rare instances, Portland cement. Preparation involves: (1) The filling of cracks or holes with equal parts of distemper and plaster of paris, diluted with water; (2) removal of dust; (3) the painting of nail-heads (with flat-paint, prepared from white lead), and (4) priming the surface with distemper

thinned with equal parts of water and petrifying liquid. Water paints are sometimes stiff and difficult to mix, but this is overcome by warming over a gas-ring and, if necessary, by sieving through a perforated zinc strainer (Fig. 15).

The application of these distempers should follow the order recommended for size distemper—*i.e.*, by painting a series of parallel strips, working from right to left, and joining up to the previous strip whilst the edge is still wet. Brushwork is precisely the same as in painting; the colour is thinned to an easy brushing consistency and is spread (not too sparingly), crossed, and laid off in one direction. Brush-marks generally flow out and disappear within a few minutes.

Be sure to mix enough material for the area concerned. This can be calculated with reasonable accuracy from the assumption that 1 lb. of stiff paste covers approximately 6 square yards (one coat only) when thinned with $\frac{1}{4}$ lb. petrifying liquid and the necessary water. The material can be tinted in the same manner as size distemper.

Old Surfaces

Old distemper must be washed off as in size distempering, but in this case we stress the need for thoroughness. The surface produced must be as clean as new plaster, otherwise the new material will flake off. If the old material is of a really washable type and cannot be removed we can at least sponge down the surface with dilute sugar soap and rinse with clean water. Semi-washable distempers are the most troublesome. These should be soaked by frequent applications of hot water and, when softened, the whole should be stripped off by scraping, and then by sponging down with clean water. Distemper which cannot be removed by this method may

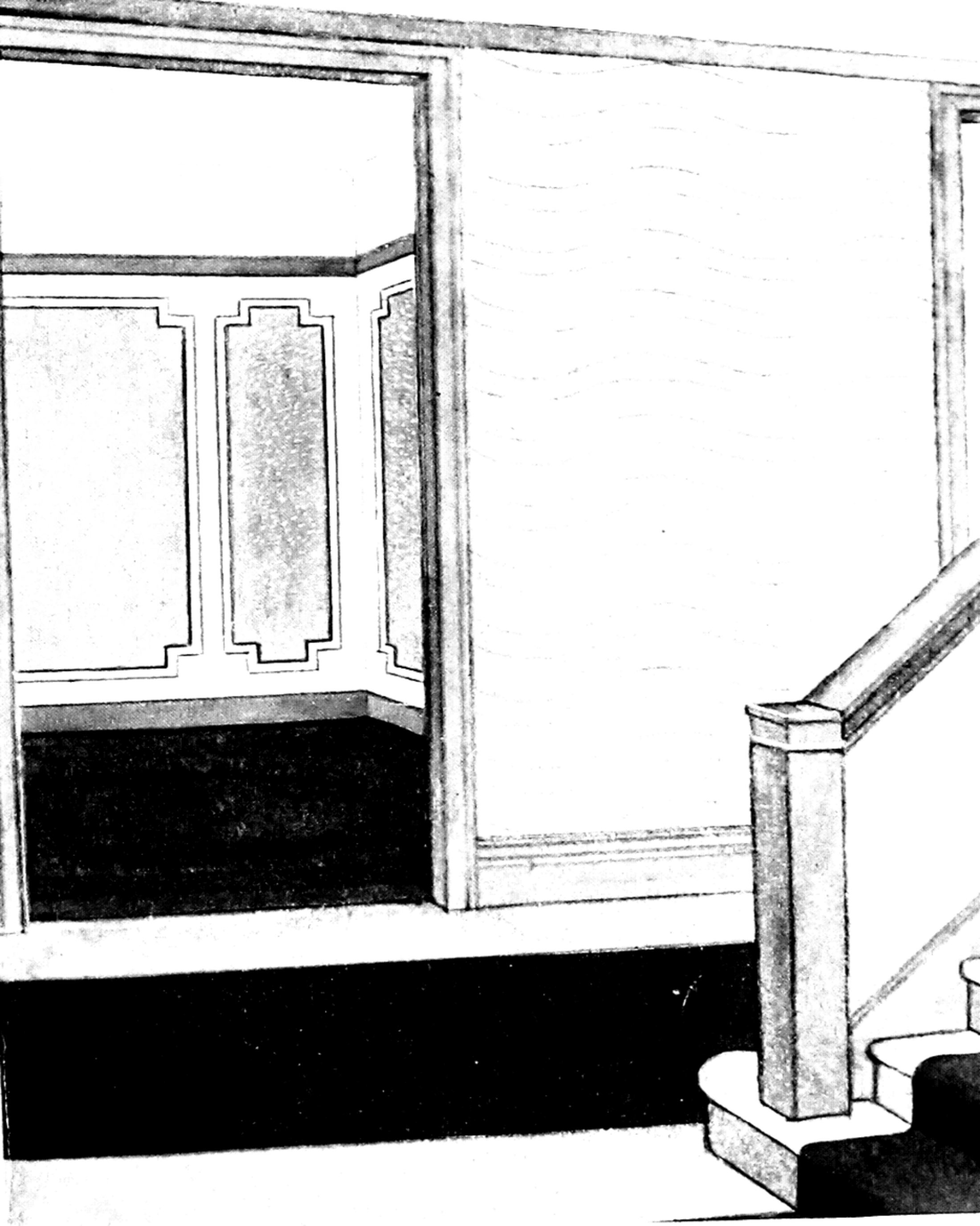
be regarded as quite safe, and ready for re-decorating. Incidentally, it is not always realised that old distemper is more beneficial to garden soil than to the drains.

Painted ceilings should not be coated with oil-bound distemper unless the surface is sized and hung with lining paper. We have seen many instances of surfaces previously treated in flat-paint which after re-decoration with washable distemper have cracked badly. Size distemper is safe and preferable for use upon flat-paint, but only in rooms free from condensation.

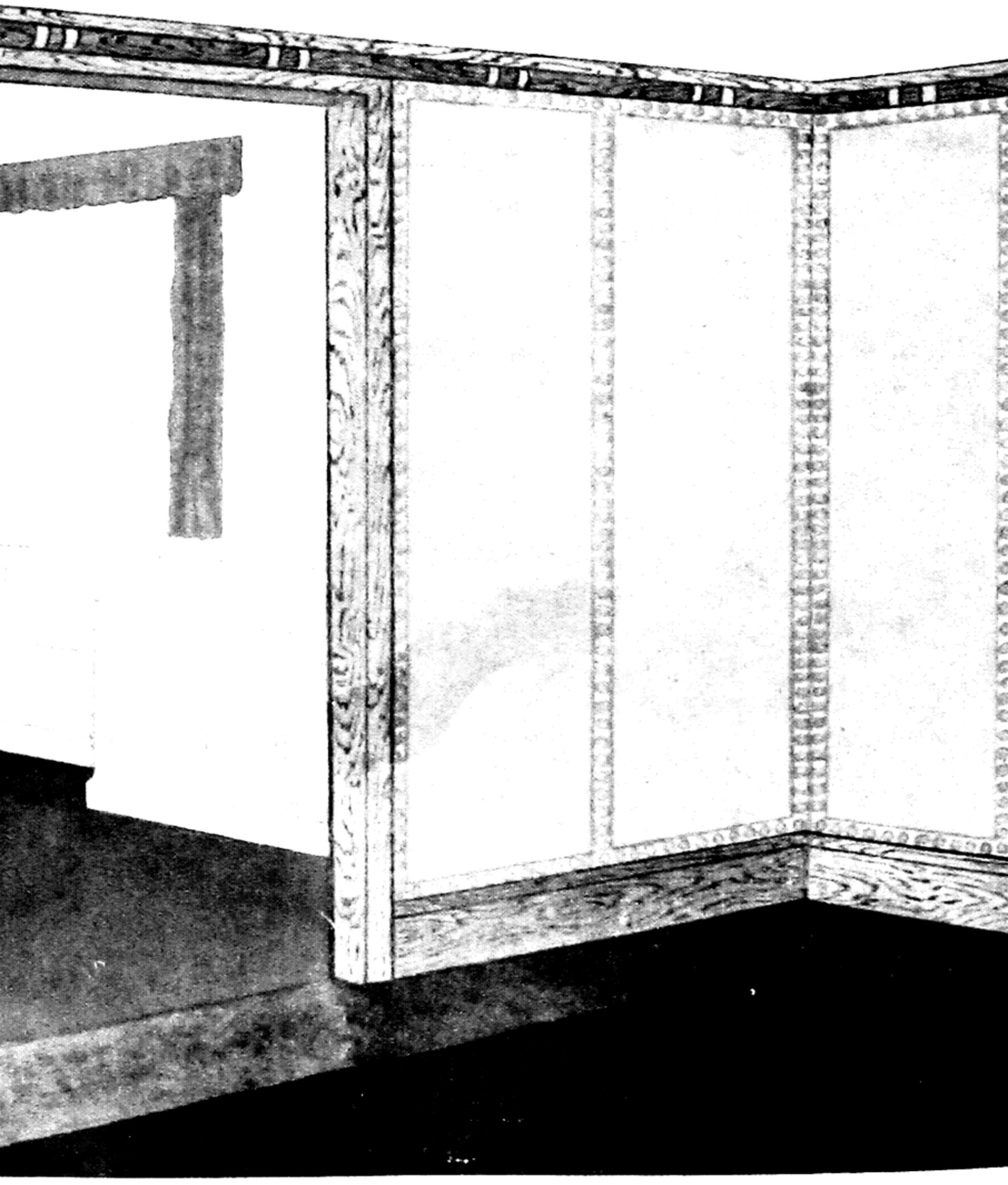
The preparation of old paintwork is not a difficult operation. A preliminary wash down with sugar soap (obtainable with full instructions from any paint dealer) and a rinse with clean water is quite sufficient. Glossy surfaces MUST be rubbed down to a matt finish during the washing operation and the surface stopped, sized, and then lined.

Papered ceilings should be treated as specified for semi-washable distemper—*i.e.*, soaked repeatedly with hot water and then stripped with a broad scraper, taking care not to damage the plaster beneath. It is much easier to brush water over a ceiling than to scrape off the paper before it is soaked, and it requires less energy to wet the whole ceiling and to repeat the process until the paper can be torn off in large pieces. As each strip of ceiling is completed, the plaster surface is sponged with clean water to remove old paste and size which, if allowed to remain, would induce flaking. Finally, follow the routine procedure of stopping cracks and other defects with plaster of paris.

Surfaces prepared in accordance with the foregoing instructions are ready for distempering in the usual manner. There is, however, one instance where a little preliminary touching-up may be necessary. All plaster repairs on oil-bound distemper work should be brought



FIGS. 101 AND 107.—HALL AND LOUNGE (*see p.* 292).



FIGS. 109 AND 110.—DINING ROOM AND KITCHEN (*see p.* 301).

forward to the same condition and colour as the surrounding surface. This can be done by coating with flat oil paint or oil-bound distemper, touching-up the repair only, until excessive porosity is checked. If this is neglected, the patch will dry out much paler than the surrounding area, thus necessitating an extra coat over the whole surface. This point is an equally important preliminary to any oil-painting job.

Painted Ceilings (Flat Finish)

Preliminary work on the lines suggested for oil-bound distempering must first be completed. It will, of course, be quite unnecessary to line a surface already painted, but the rubbing down of gloss paint and the washing of other surfaces are very necessary. Surfaces are treated according to their porosity, which means that new plaster, old plaster previously distempered, and papered surfaces fall into the same category when preparation is completed. Similarly, those already coated with flat oil paint and oil-bound distemper can be treated alike, as non-porous materials.

Since the question of durability against weathering is not applicable the whole job can be executed in "lithopone" or other zinc white paint which is immune from

Table Showing the Composition of Paints Employed Upon Porous Surfaces

Coat.	Zinc white.	Patent driers.	Refined linseed oil.	Turpentine.
First . .	7 lb.	8 oz.	1½ lb.	½ lb.
Second .	7 lb.	8 oz.	1 lb.	¾ lb.
Third . .	7 lb.	6 oz.	¾ lb.	¾ lb.
Fourth .	7 lb.	2 oz.	nil.	1½ lb.

(*Note.*—1 lb. of zinc paint should cover between 5 and 6 square yards of surface, one coat only).

discoloration by fumes from coal or gas fires. Paint can be mixed in accordance with the following table, or purchased as semi-gloss paint and thinned with varying proportions of oil and turpentine to meet surface requirements. The finishing coat should be of flat or egg-shell flat-paint and can be home-made if desired.

Non-Porous Surfaces

Previously painted work can be given one or two coats of egg-shell flat-paint (see fourth coat, above).

Oil-bound distemper will require a preliminary coat of semi-gloss paint (third coat, above), before the application of a flat finish.

A ready-prepared semi-gloss paint can be thinned as suggested in the above table, the amount of oil being reduced as surface porosity is checked.

Oil paint is applied in the same orderly manner as oil-bound distemper, but with a 3-inch flat paint brush. Because of the quick setting nature of the material it is advisable to execute the work in strips of less than 2 feet in width, crossing and laying off as lightly as possible and leaving no brush-marks. In the final coat it is particularly essential to join up to the preceding strip as rapidly as possible and certainly before the edge becomes set, otherwise the joins are liable to dry with a slight gloss. It will be found that one man can deal comfortably with a ceiling up to 9 feet in width, but larger areas require two men working side by side on the same plank.

Stippling

This term describes the operation of dabbing the newly painted surface with a dry brush, to ensure even distribution of the paint, eliminate brush-marks, and produce an effect of very fine texture. Special brushes are made for the purpose (Fig. 54), but as these "stipplers" are



Fig. 54

Painting and stippling a ceiling.

The work is carried out in a series of strips— indicated by dotted lines.

an expensive luxury the majority of amateurs prefer to improvise and use a soft hand-brush.

Stippling must be carried out immediately after each strip is painted; a job which obviously calls for an assistant capable of keeping pace with the painter. The wet paint should be dabbed lightly and squarely with the tip of the brush, covering each section (Fig. 54) systematically and making sure that no part is missed. On completion, follow the usual practice of washing out the brushes, first by dabbing in white spirit or paraffin, and then by washing with ordinary soap and hot water.

Washable distemper can be stippled in the same manner, but, after use, brushes are rinsed in cold water and then with soap and water until clean. Brushes employed in oil paint are left standing in water during the short periods between use, but they should be washed properly when the job is finished. Store in a dry (not hot) place and sprinkle flake naphthalene inside the container, to prevent damage by moth.

Plastic Paint

The general preparation for painting is equally applicable in the case of plastic paint. Porous surfaces are then primed with oil paint and non-porous surfaces are roughened by coating with semi-flat paint containing about 5 per cent. of powdered pumice stone. Both types of surface provide adequate key for any form of plastic paint, and the basis of oil paint enables the material to be burnt off when required.

A badly cracked ceiling can be prepared, covered with scrim or other calico as a safeguard against further cracking (see p. 167), sized, and primed with a thin coating of flat-paint. A more decorative effect is secured by the addition of a narrow bead, fixed to form a centre panel and surrounding border. Wood beading is coated

with glue and fixed with panel pins, but "Anaglypta," "Lincrusta," and other relief borders are fixed with "Dextrine," a paste obtainable from wallpaper merchants.

A reliable paint of the so-called plastic type is obtained by mixing oil-bound distemper and plaster of paris in proportions of 1 to 2, adding water sufficient to form a thick creamy consistency, but keeping the mixture as stiff as is possible for brush-applied material. To obtain high-relief patterns the compound is applied as a stiff paste and spread with a trowel or broad scraper.

Plastic paint is applied as thickly and evenly as possible; its slow-setting nature keeps the material soft for an hour or more and gives ample time for spreading and texturing afterwards. On large areas it is advisable to work as in stippling, one man painting and the other introducing pattern. Simple all-over pattern is produced by stippling with a brush, sponge, or flat piece of wood, but for speedy results a paper-hangers' 9-inch roller is unbeatable. A photographic roller is equally capable of forming pattern by suction when rolled across the wet surface.

There is no limit to the patterns obtainable, these should be tried out on a small scale prior to the more important job. The following give excellent results: (1) A combined dabbing and twisting motion with an old paint brush; (2) similar swirling movement with a sponge; (3) short dragging and rocking strokes with a broad scraper; (4) combing with a home-made celluloid comb. Should the pattern appear unduly rough and spiky, protuberances can be flattened by means of a roller, or celluloid squeegee: this operation to be carried out when the material is sufficiently set (Fig. 55).

Plastic surfaces are usually finished in flat oil paint, or oil-bound distemper, with the surrounding border and bead in harmonising tints. This panelling arrangement

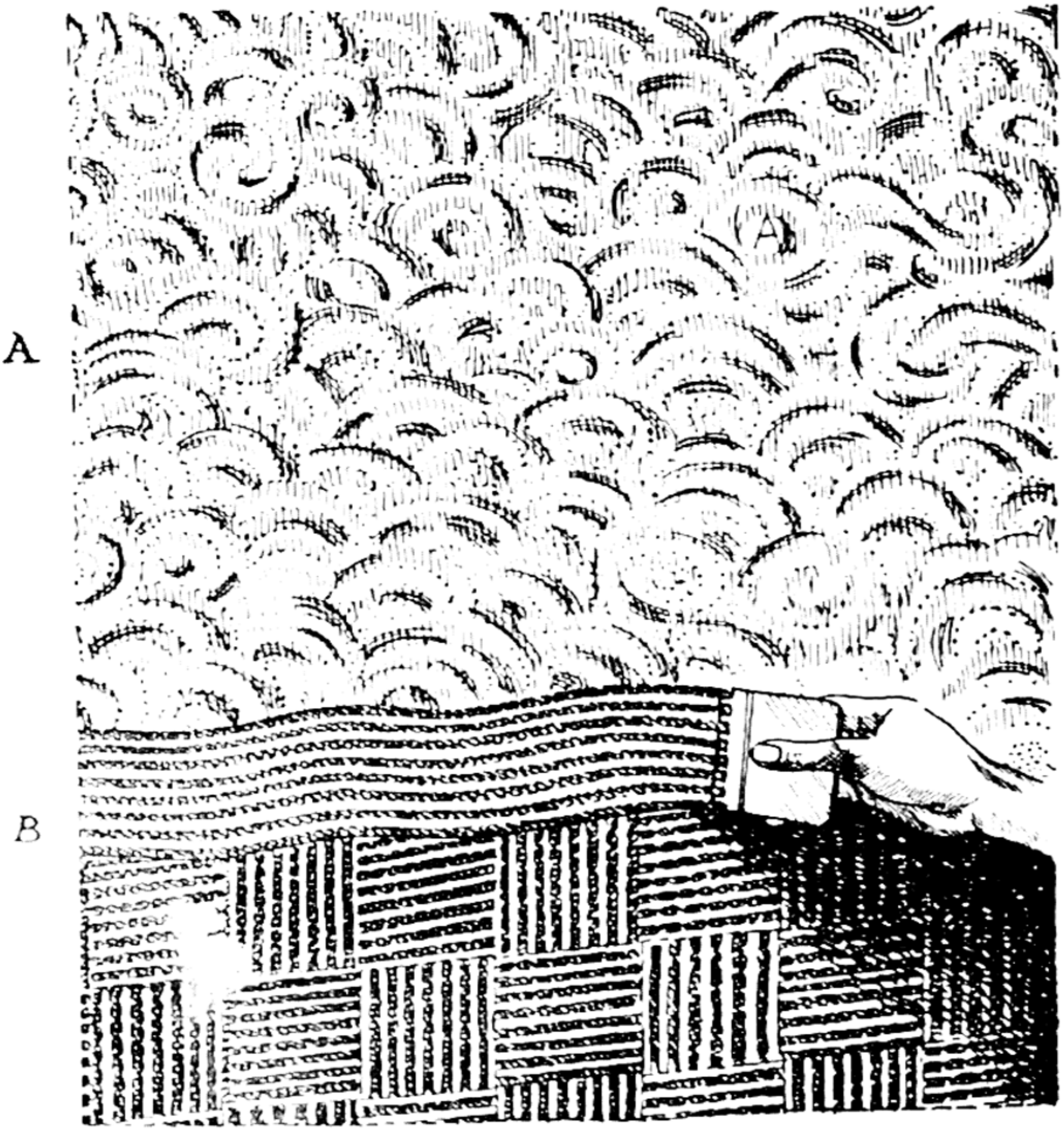


Fig. 55

Patterns in Plastic Paint.

A *is a swirl pattern executed with a sponge.*

B *shows an alternative produced by combing.*

is a great help to beginners, even upon plain ceilings. It enables large areas to be divided into easily manageable sections.

Paper-hanging

Surface Preparation

Having already considered the details of preparation (see pp. 148 and 188) it is not proposed to dwell further on the subject save for necessary modifications in treatment. These we give in the form of brief specifications appropriate to the surfaces mentioned.

New Plaster.—Allow time for drying out, then glass-paper and size.

Dampness, including newly plastered repairs.—Apply one coat of anti-damp solution when surface-dry.

Painted Surfaces.—Wash and rub down to a dull finish, make good defective plaster, and apply one coat of claire-colle, or, better still, size, and hang lining paper to offset condensation.

Portland Cement.—Size, and hang lining paper to prevent damage by condensation. This type of cement is unsuitable as a base for paper-hangings.

Asbestos Sheets.—Paint all nail-heads, stop open joints, and apply one coat of oil-bound distemper. Distemper prevents discoloration by alkaline substances within the asbestos.

Keene's Cement.—Rub down with No. 2½ glass-paper to form key, then size and cross line to prevent condensation. (*Note.*—Lining paper should always be hung at right angles to the superimposed paper, hence the term cross line.)

Compressed Board (Wall-boards).—Paint joints and nail-heads; stop open joints with plaster, size, and paste a strip of 1½-inch roller bandage over each joint to prevent ridging or splitting of the final paper.

Previously Papered Surfaces.—Soak, strip, wash, stop, glass-paper, and size.

Oil-bound Distemper.—Wash, stop, glass-paper, and coat with weak size.

Size-distemper.—Wash off, stop, glass-paper, and size.

Match-boarding.—Cover with scrim or calico; this to be stretched, secured by copper tacks, and then sized.

Measuring for Paper

The standard size of a roll of English wallpaper (or lining paper) is 11½ yards long by 21 inches wide. Imported material varies according to origin, French wallpapers being 9 yards by 18 inches, and American goods 8 yards by 18 inches or 16 yards by 18 inches, according to its classification as a single or double roll. Lining paper is also available in rolls of 11½ yards by 30 inches and English border is 9 yards by 21 inches.

There are several points to remember when measuring-up for ceiling or wallpaper. (1) A ceiling should, whenever practicable, be commenced on the window side and continued strip by strip away from the window as in distempering. The advantages of this method are: (*a*) The paper-hanger works with his back to the source of light and is thus able to see the pattern more clearly, and (*b*) the joints cast no shadows and are less prominent. (2) Some waste is inevitable; at least 6 inches should be added to each length for matching of patterns. (3) Each strip of paper must be applied as a complete length; not applied in two halves and pieced in the centre.

A full roll of paper should produce three lengths of 11 feet 6 inches; four lengths of 8 feet 6 inches; five lengths of 5 feet 10 inches, and so on. There is, however, the possibility of short rolls, and of ends being dusty or damaged; any of which will obviously upset one's calculations. By measuring the length required and adding

6 inches for waste, we can determine the number of lengths obtainable from a roll. Then we mark off 21 inches on the 2-foot rule and measure the number of lengths required.

If, for example, a room measures 12 feet 6 inches by 10 feet, with the window on one of the short sides, we should calculate as follows: As lengths of 10 feet are required, each roll gives three lengths only. By measuring the number of 21-inch widths contained in the long wall (Fig. 56) we ascertain that seven lengths will cover the whole ceiling, apart from a 3-inch strip which can be obtained from the oddments left over. The ceiling will require $\frac{7}{3} = 2\frac{1}{3}$ rolls, which means that three rolls must be ordered. It will be found that paper will often cut up to better advantage when the same type of paper is used for ceiling and frieze. (For varieties of paper, see pp. 168 and 199.)

Mixing the Paste

There are three types of paste from which to choose: (1) Cold-water paste, obtained as a proprietary material, in powder form; (2) starch paste, and (3) flour paste. The first is added a little at a time, to the specified amount of cold water, stirring until the paste thickens. It should be mixed the day before use to ensure the maximum degree of tenacity. Paste of this type has the advantage of being colourless.

Starch is particularly valuable as an adhesive. It is colourless, extremely tenacious, free from lumps, and possesses remarkable sliding properties—*i.e.*, it enables the paper to slide into the matching position after application to a surface. Its preparation is simple; $\frac{1}{2}$ lb. of starch is mixed to a batter with cold water, and then scalded by the addition of 1 gallon of boiling water, stirring briskly until thickening occurs.

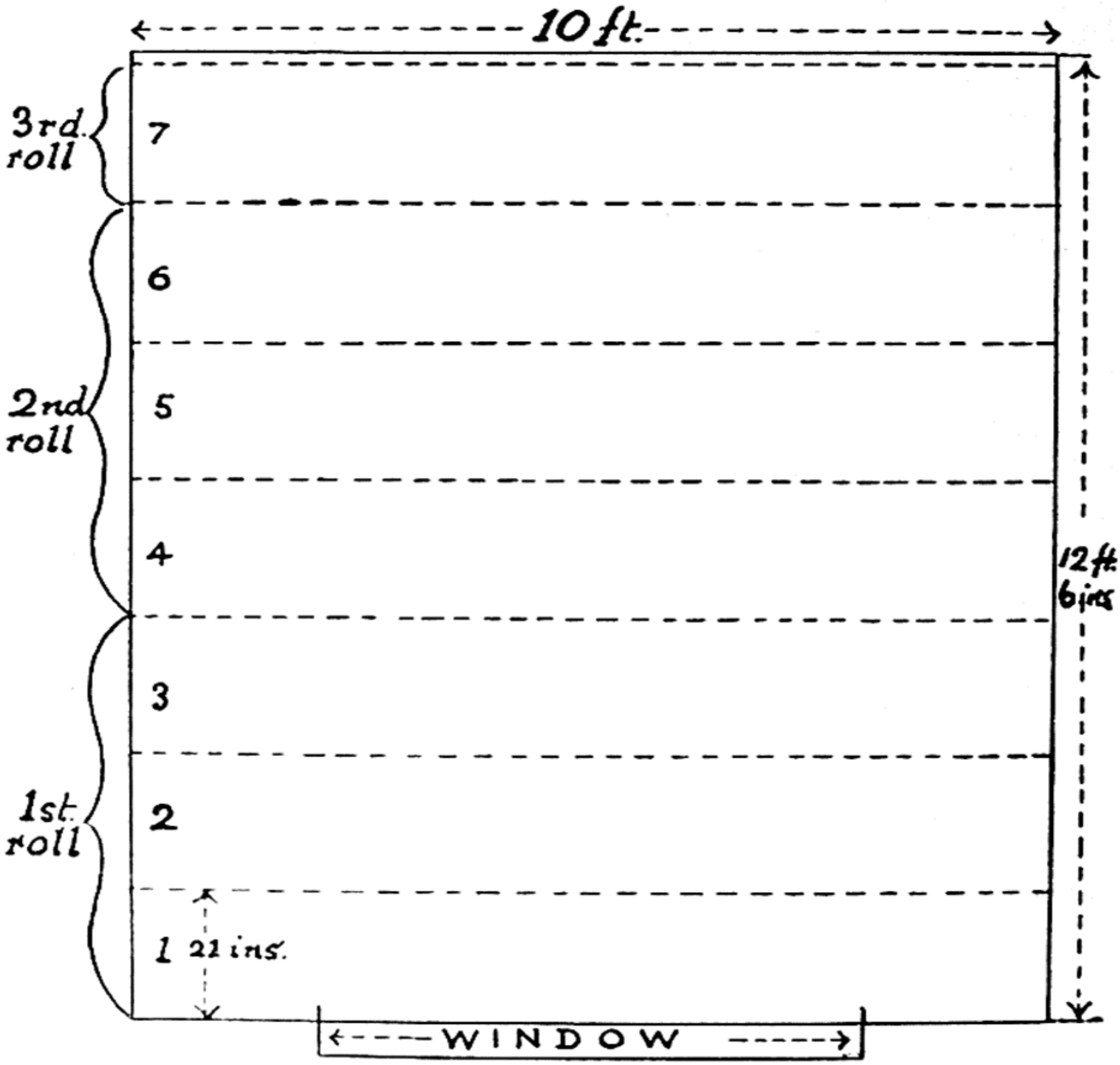


Fig. 56

Measuring a ceiling for paper

Three rolls required

Common flour makes a paste comparable with starch, but its deep colouring renders it unsuitable (at least for beginners) for use with white ceiling papers. For lining paper and medium-toned wallpapers it is unsurpassed. Flour paste is prepared as follows: Mix 2 lb. of common (not self-raising) flour with tepid water, stirring briskly until a smooth batter results; add half a teaspoonful of borax, and scald with 1 gallon of boiling water, stirring rapidly until the mixture thickens. It is of the utmost importance that the water is actually boiling when poured into the batter. If the paste does not thicken immediately it must be cooked (and stirred) over a gas-ring until of the right consistency. Should the paste be lumpy it can be brushed through a distemper strainer. Cover with a little cold water to prevent the formation of a skin.

Trimming, Matching, and Cutting

Although these preliminary jobs are placed in the correct order, there is one point which must always take precedence. The various rolls of paper must be compared to see that all are of exactly the same shade; any odd rolls can usually be exchanged, providing that they are returned to the merchant untrimmed.

Trimming consists of cutting off the selvedge, which is generally marked by a line. If this is not done carefully, the pattern cannot match truly. The extent of the trimming will depend upon the type of paper, the skill of the paper-hanger, and the smoothness of the ceiling. The best class of work demands the complete removal of both edges, but this is inadvisable in the case of very old ceilings which are no longer level. Until some experience has been gained it is better to trim off the whole of one selvedge and about half of the other. Semi-plain (mottled) and other papers devoid of matching

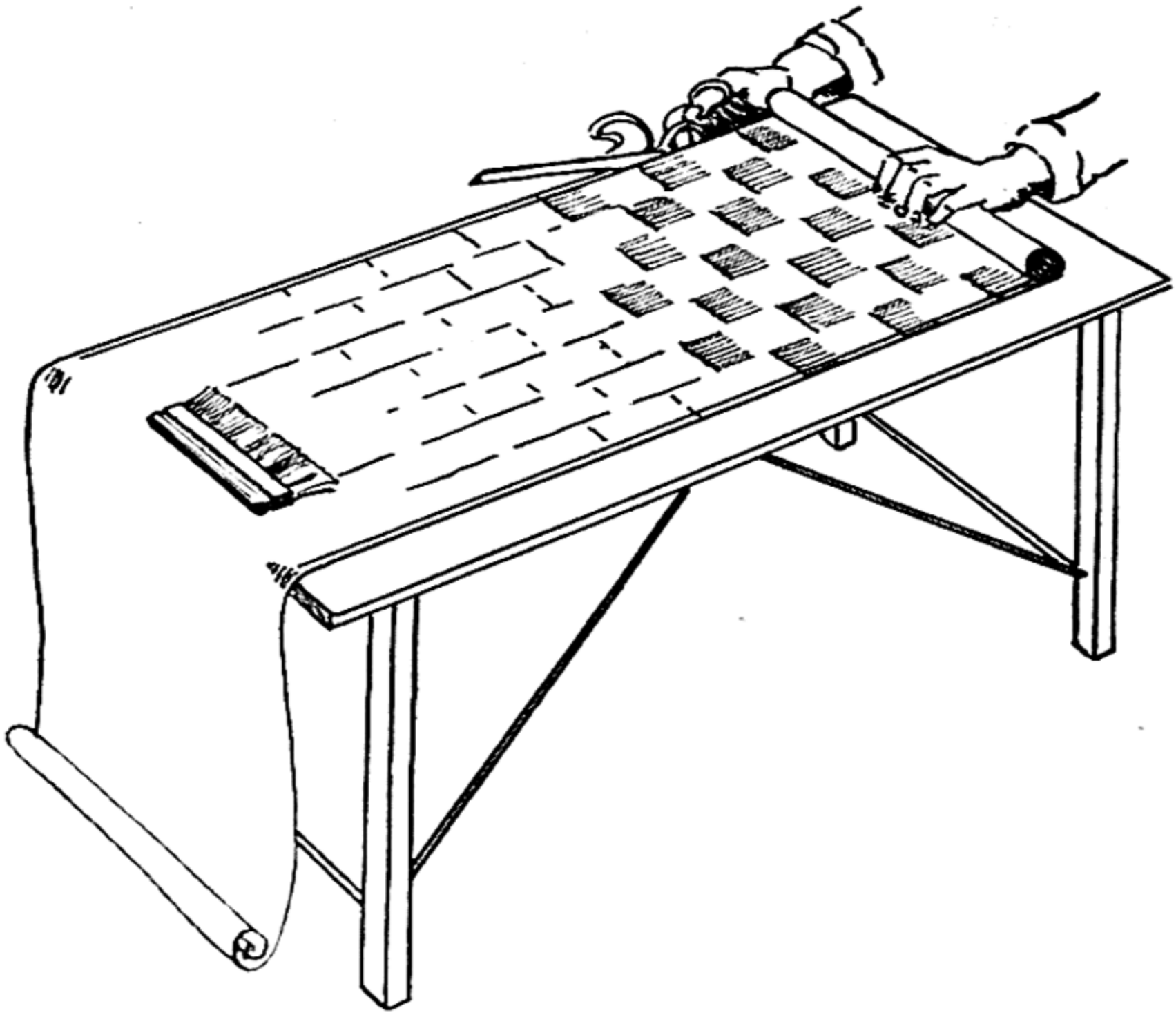


Fig. 57

Trimming a roll of wallpaper.

points invariably have broad selvedges bearing the warning "Reverse each length." These should be trimmed at least $\frac{1}{8}$ inch inside each guide line, and, since the paper must be reversed when hanging, both edges are removed.

Wallpaper merchants will sometimes trim the material for a small charge, but if this cannot be arranged, the paper should be draped across a table and cut with scissors (Fig. 57) or with a patent trimmer of the "Morgan Lee" type (Fig. 58). To trim paper in the manner sometimes adopted by paper-hangers (in a sitting position) requires a fair amount of practice and is not recommended for beginners.

The measurement, matching, and cutting of the required lengths of paper demand care and foresight, particularly in the case of a patterned paper. The ceiling must be measured accurately and at both ends, because it is not uncommon to find rooms out of square. When this occurs we must follow the procedure normally employed for hanging material with large patterns—*i.e.*, we must construct a line across the centre of the ceiling and at right angles to one of the long walls (Fig. 59A). The position may have to be modified to come into line with a lighting fixture, or the centre of a chimney breast, but the exact position must be determined.

A large pattern should be centred to the ceiling rose or other selected point, the various lengths being applied on either side of the guide-line, thus working from the centre, outwards. Small patterns and semi-plains are run parallel to the window wall, at which point operations are commenced.

The first essential is a clean paste-bench of 6 to 7 feet in length and about 2 feet in width. This can be hinged, to fold lengthwise, or can be improvised from tongued and grooved timber laid across a kitchen table. The

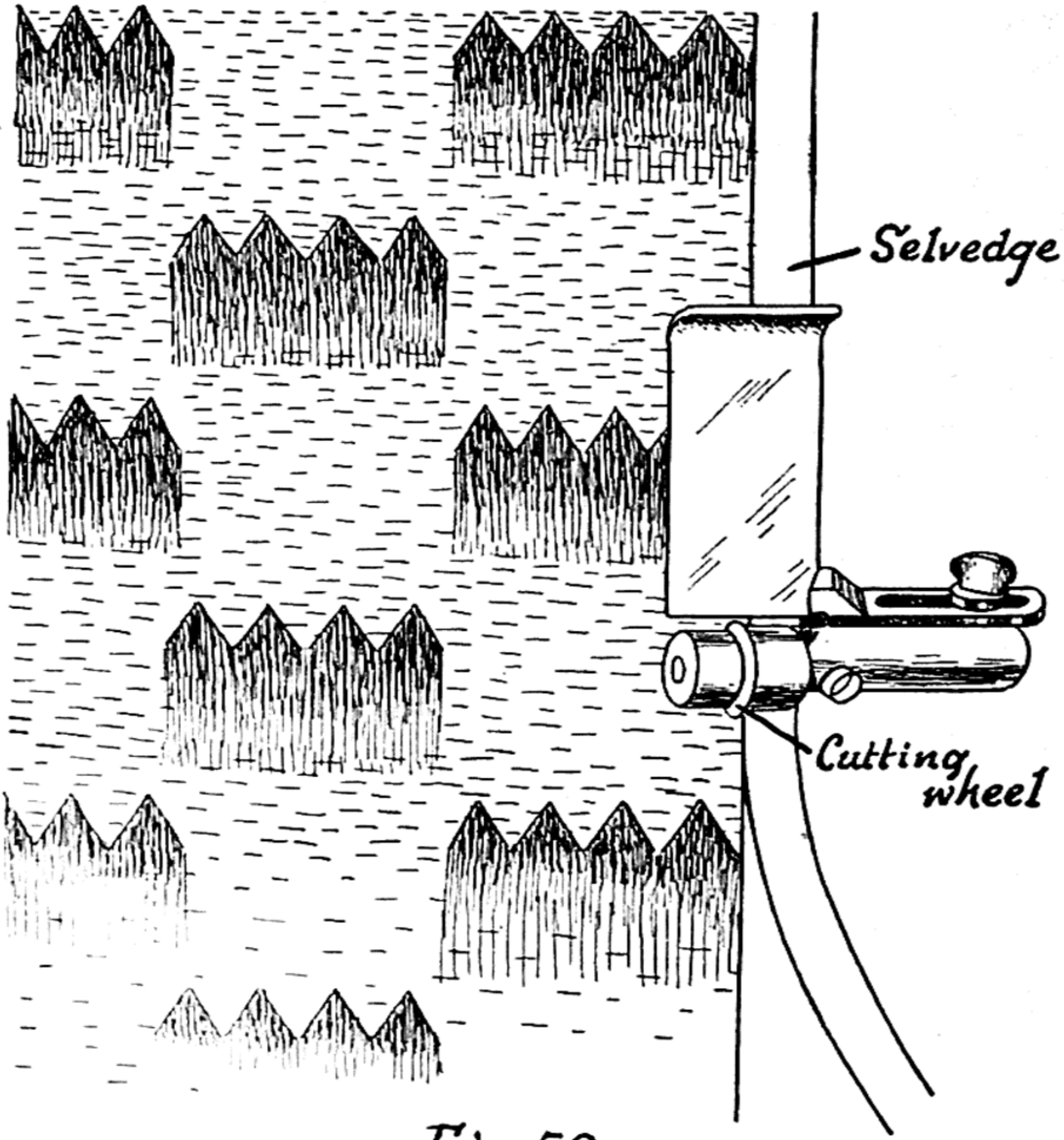


Fig. 58

The Morgan Lee trimmer
can be adjusted
to remove any width of selvedge

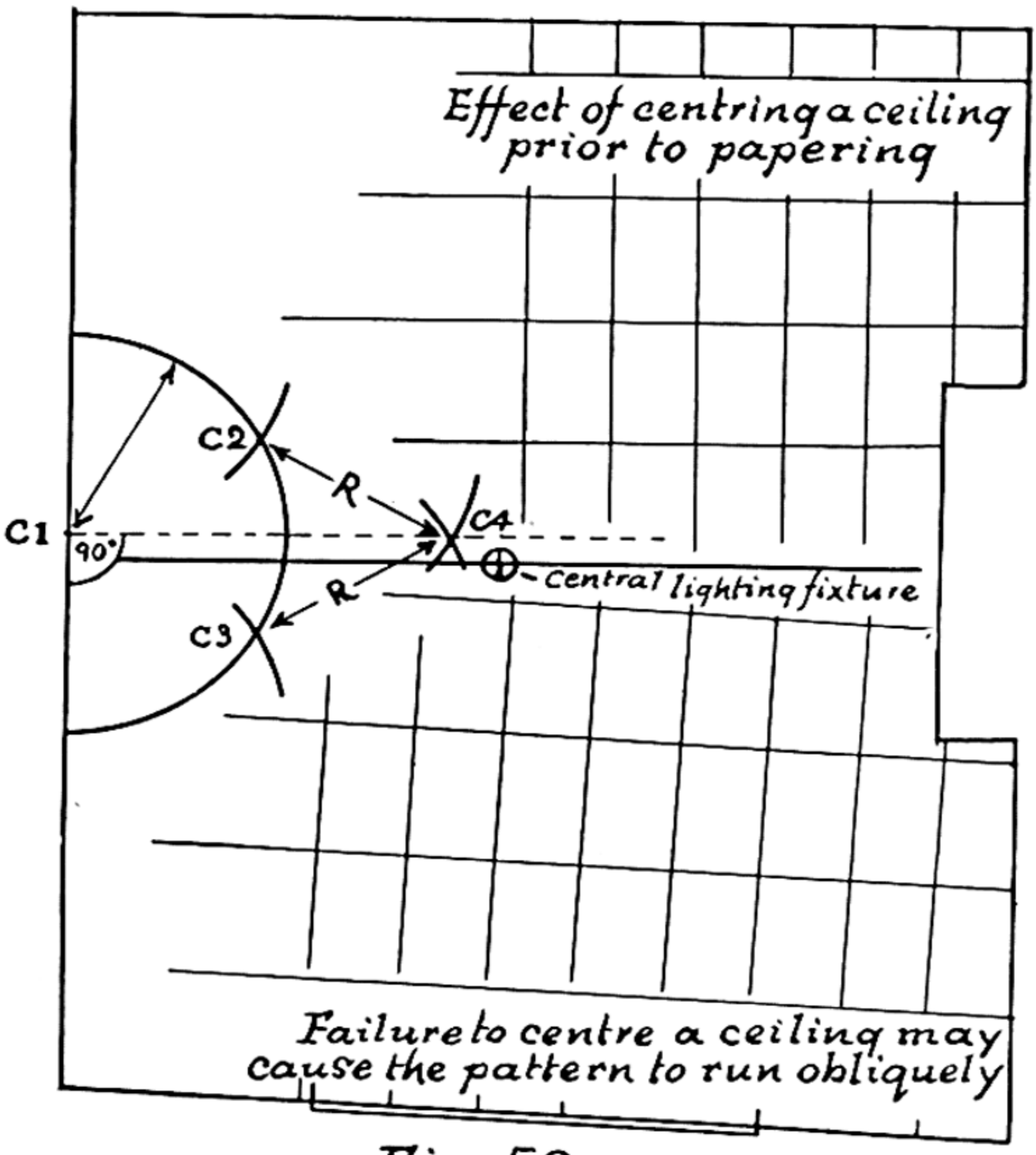


Fig. 59A

Method of centring a ceiling, the window side of which is out of square.

With any radius (R) construct a semi-circle from point (C1), and intersecting lines from (C2) & (C3). Draw a line through (C1) and (C4) from which to measure a parallel line passing through the central lighting fixture.

front edge and ends should be planed to give a smooth, straight, and angular finish.

In cutting the first length of a small patterned paper, place the material face upwards on the bench, measure the precise length required, add 2 inches for waste and then try to adjust matters so that the pattern is the same at each end. By this method we can at least arrange for the first length to appear nicely balanced. Make sure that the inevitable dust mark (at the end of the roll) is not included.

Before cutting the first length, observe the matching-point. Some patterns repeat in a simple straightforward manner with the matching-points at right angles to the length; these are known as "set" patterns (Fig. 60A). Others—"drop" patterns—repeat diagonally (Fig. 60B), and, in a few instances, especially when the pattern is very large, alternate lengths must be reversed (Fig. 60C). Whenever possible, the lengths should be cut with the minimum of waste—a point which is often achieved by cutting alternate lengths from different rolls of paper. It is advisable to cut at least eight lengths, allowing some 3 inches at each end for waste. These are turned face downwards with the matching edge near the front of the paste-bench, ready for pasting.

At this stage any last-minute preparation must be attended to; the plaster cornice (if any) must be quite dry after its final coat of paint, or, if finished in size-distemper, the adjoining strip of ceiling must be cleaned and sized to a depth of 1½ inches from the cornice. If the cornice over the window is straight, this forms a guide for the front edge of the paper, but where this is curved, broken by a bay window, or entirely absent, a guide-line is required.

This is obtainable in several ways: (*a*) By drawing a pencil line linking the short lengths of cornice, B.B.

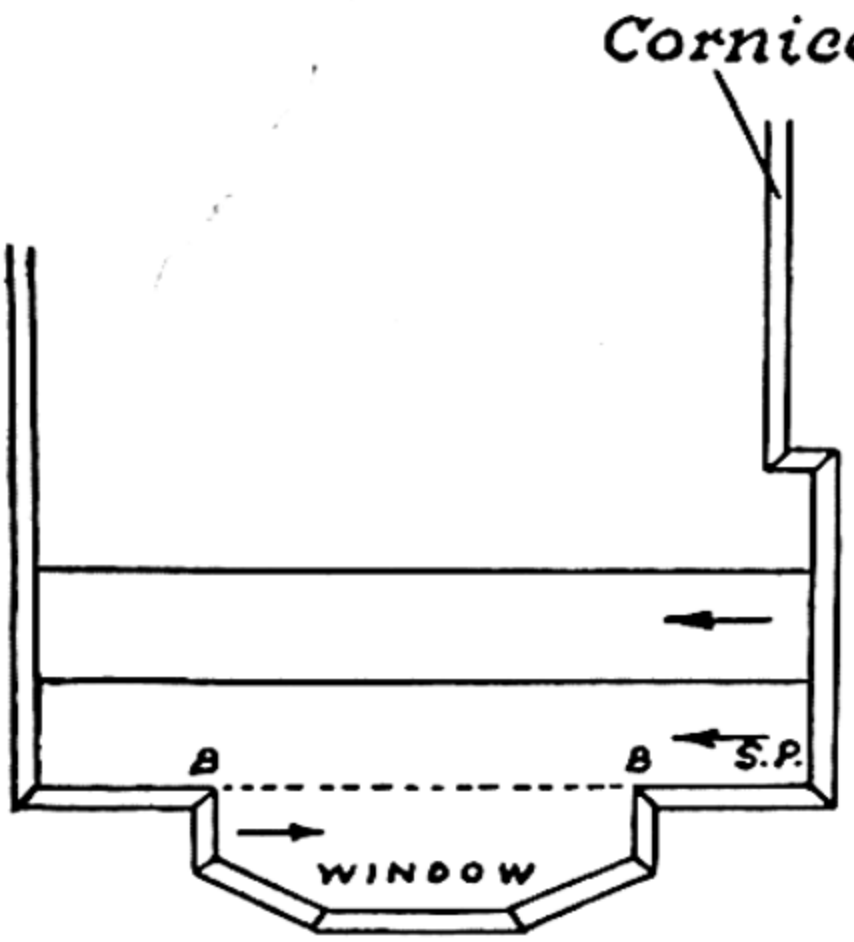


Fig 59 b

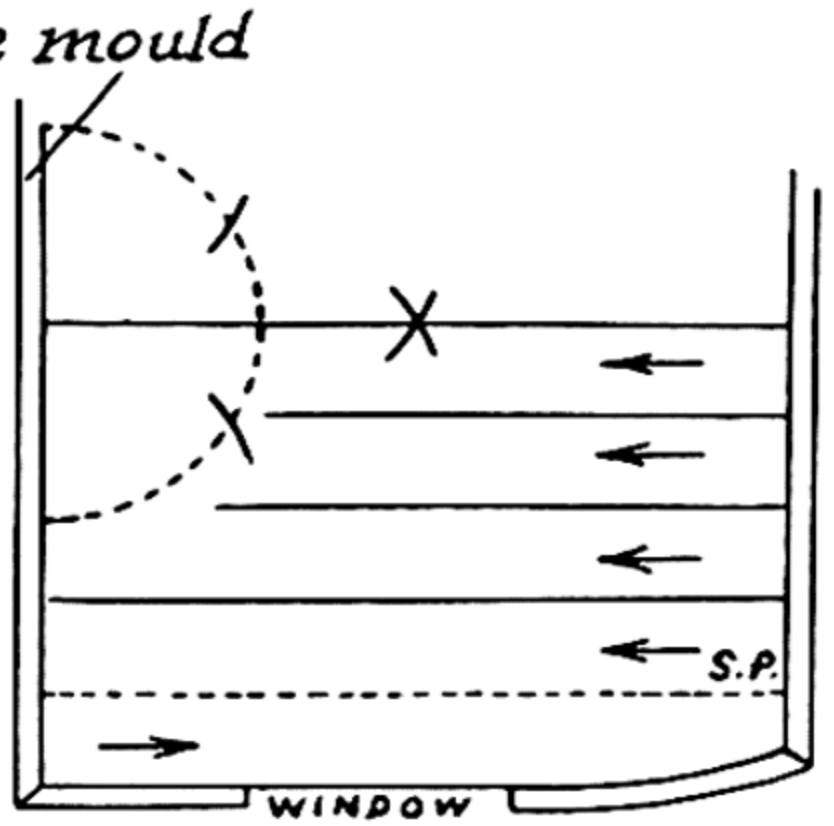


Fig 59 c

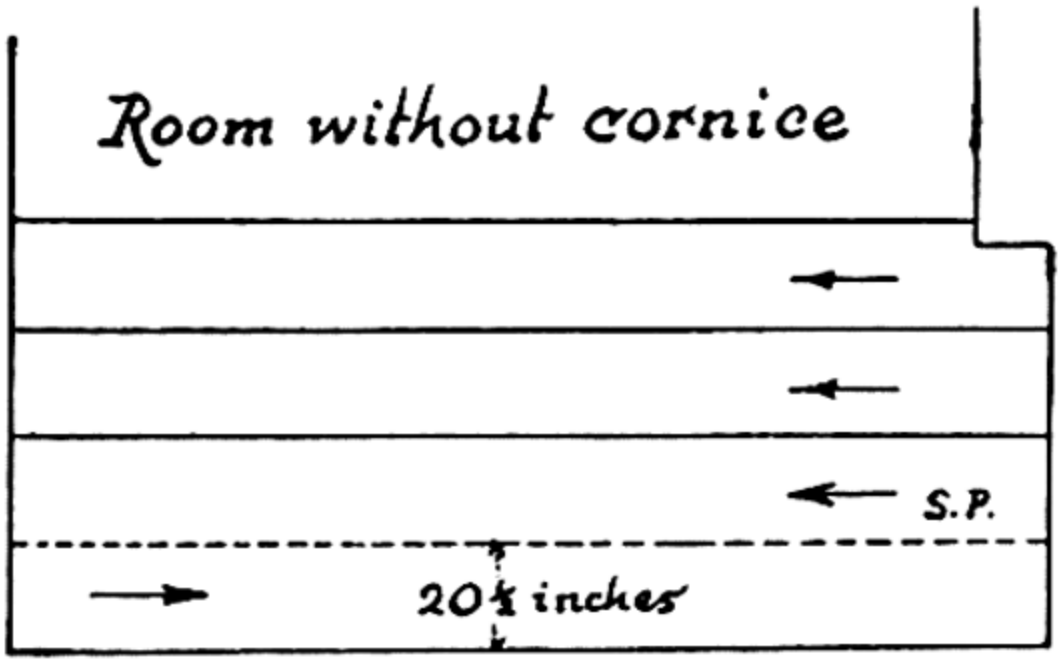


Fig. 59 D

The positions of guide lines for various types of rooms are indicated by dotted lines.

Paperhanging is commenced at S P in each case and should follow the directions shown.

(Fig. 59); (*b*) by measuring backwards from a central line to points very near to the window wall (Fig. 59C), a desirable unit of measurement being 21 inches—the width of the paper; (*c*) in the case of a rectangular room without cornice, we mark two points at 20½ inches from the wall and, with a length of chalked string held taut over each point, we flick or strike the required line (Fig. 59D). This can be used as a starting-point when papering, and the more awkward length can be applied afterwards. It is better to spend a little extra time over this preliminary operation than to risk the defect shown in Fig. 59A.

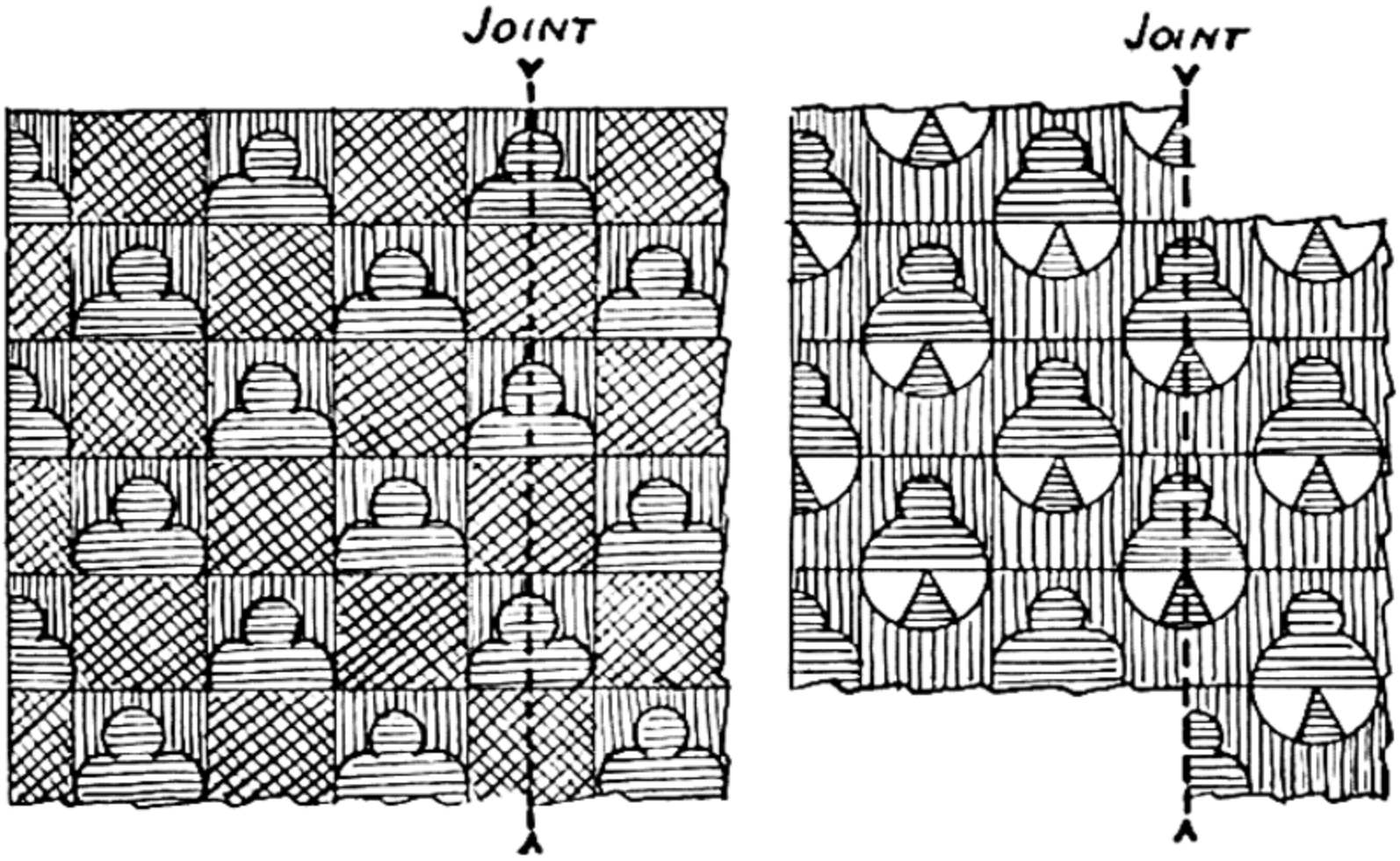
Tools and Equipment

These comprise: scissors, 10 inches in length and preferably pointed; paper-hanger's brush, for smoothing out creases (Fig. 61); 2-foot boxwood rule; half-worn distemper brush, for pasting; an apron with pocket large enough to hold scissors and papering brush; clean sponge and water; lead pencil, chalk, chalk-line, and stencil pins.

Two step-ladders and a plank of suitable length should be placed beneath the guide-line; arrange these to give 7 or 8 inches of head-room when papering the ceiling. The paste-bench is usually equipped with trestles or other supports, a convenient height being 2 feet 6 inches. The bench (including edges) must be kept perfectly clean and dry at all times, otherwise paste will disfigure the face side of the paper.

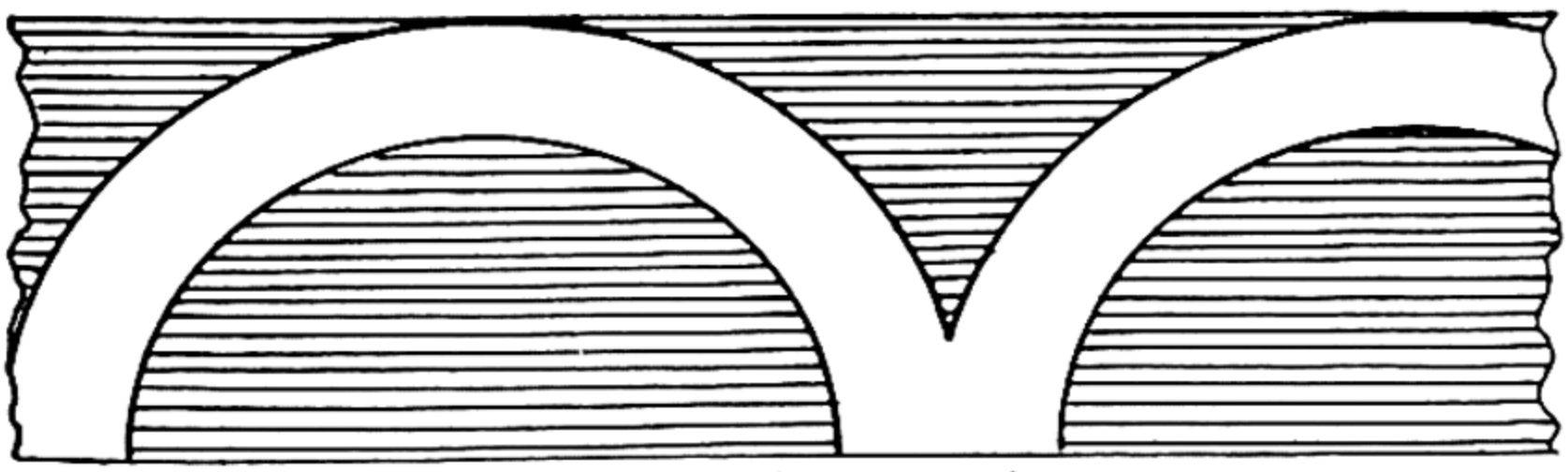
Pasting and Folding

Having already turned the paper face downwards on the paste-bench, arrange these with edges level, ends overhanging either end of the bench, and the lengths placed about 4 inches away from the front edge. The



(A) "Set" pattern

(B) "Drop" repeat



(c) "Reversible" pattern

Fig. 60

Three types of pattern repeats

(c) is sometimes employed as a basis for large patterned ceiling papers.

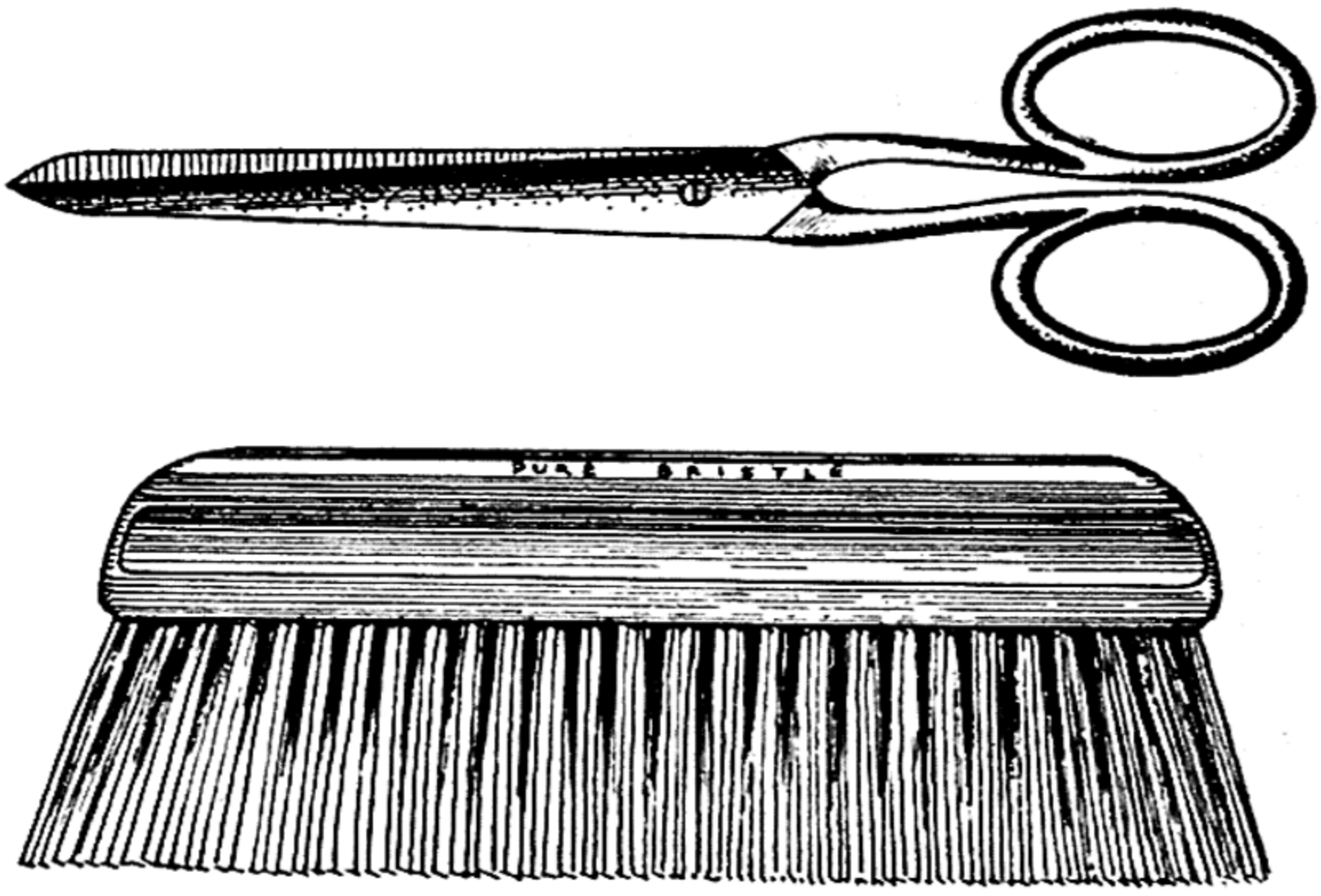


Fig. 61

Paperhanger's equipment.

first length is then brought forward until the right end is level with the right edge of the bench and the matching edge projects $\frac{1}{10}$ inch beyond the front of the bench.

Stir the paste and dilute with cold water until of a thick but easy brushing consistency, but take care not to over-thin. Commence pasting the centre of the paper in long sweeping strokes carried lengthwise and then diagonally towards and over the back edge. By lifting the back edge with the left hand and pasting always towards the edge it is possible to keep the face side quite clean and the underlying length dry. Move all the lengths very slightly towards the back edge before adjusting the matching edge, then complete the pasting of the front portion with the paper positioned as shown in Fig. 62.

The pasted area must next be folded as shown in Fig. 63, each fold being about 10 inches, and with the matching edges level. The folded pile is moved to the right of the table to permit further pasting and folding; this being continued until the length is completed. Finally, the whole paper is folded in the compact shape (Fig. 64A), with a part-roll of paper to carry the weight during application.

Hanging the Paper

This is a job for clean hands, brushes, and equipment generally. All must be KEPT in a clean and dry condition if the result is to be worth-while. The paper is held in the left hand, supported by the part-roll of paper and with the thumb holding the right-hand folds. In this position, and with brush and scissors handy, the length is carried up to the starting-point.

Grip the matching edge of the top fold (Fig. 64S), release one fold from the pile, and, when opened out, fit carefully to the guide-line. See that the paper reaches

Fig. 62

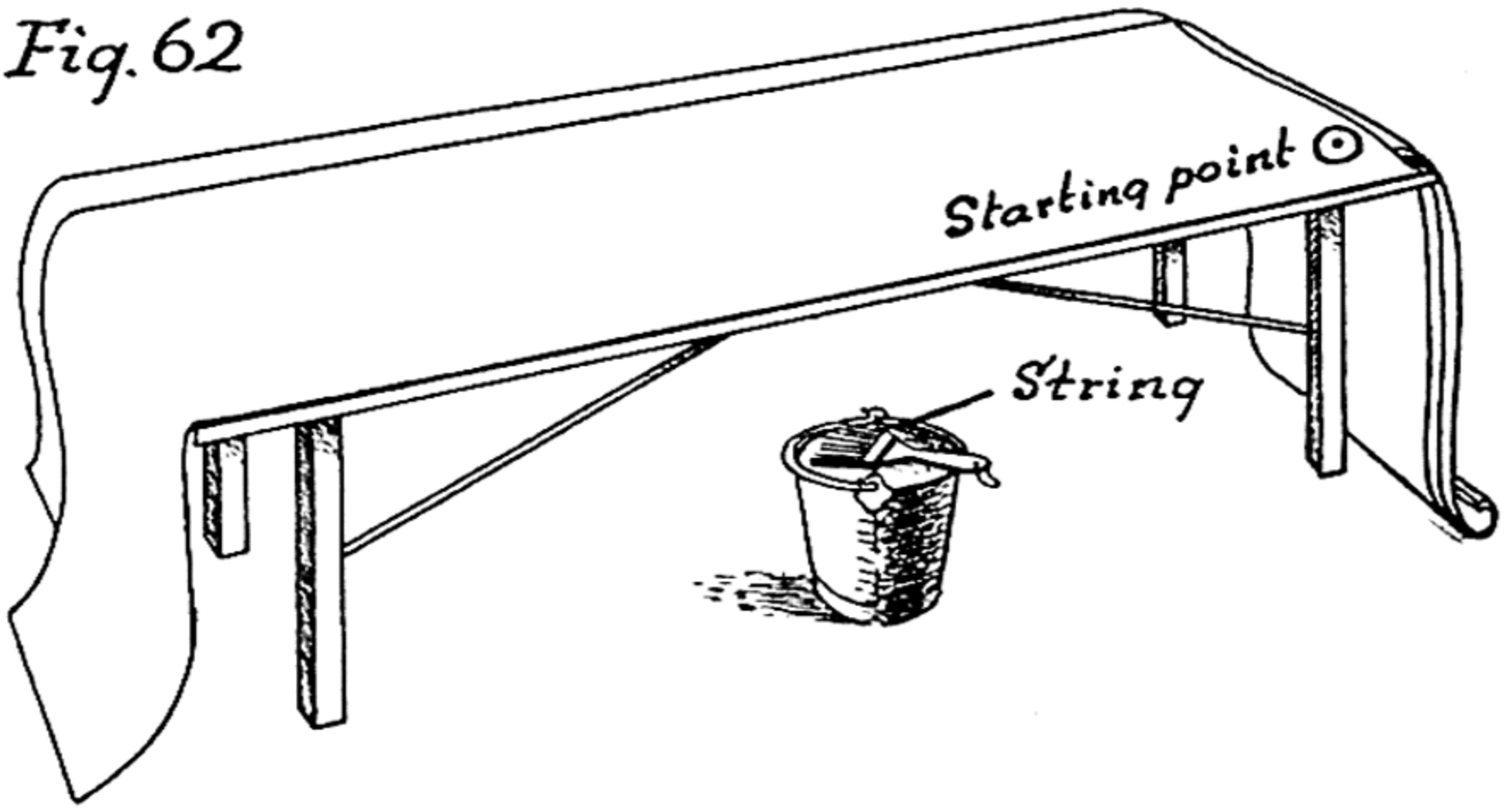
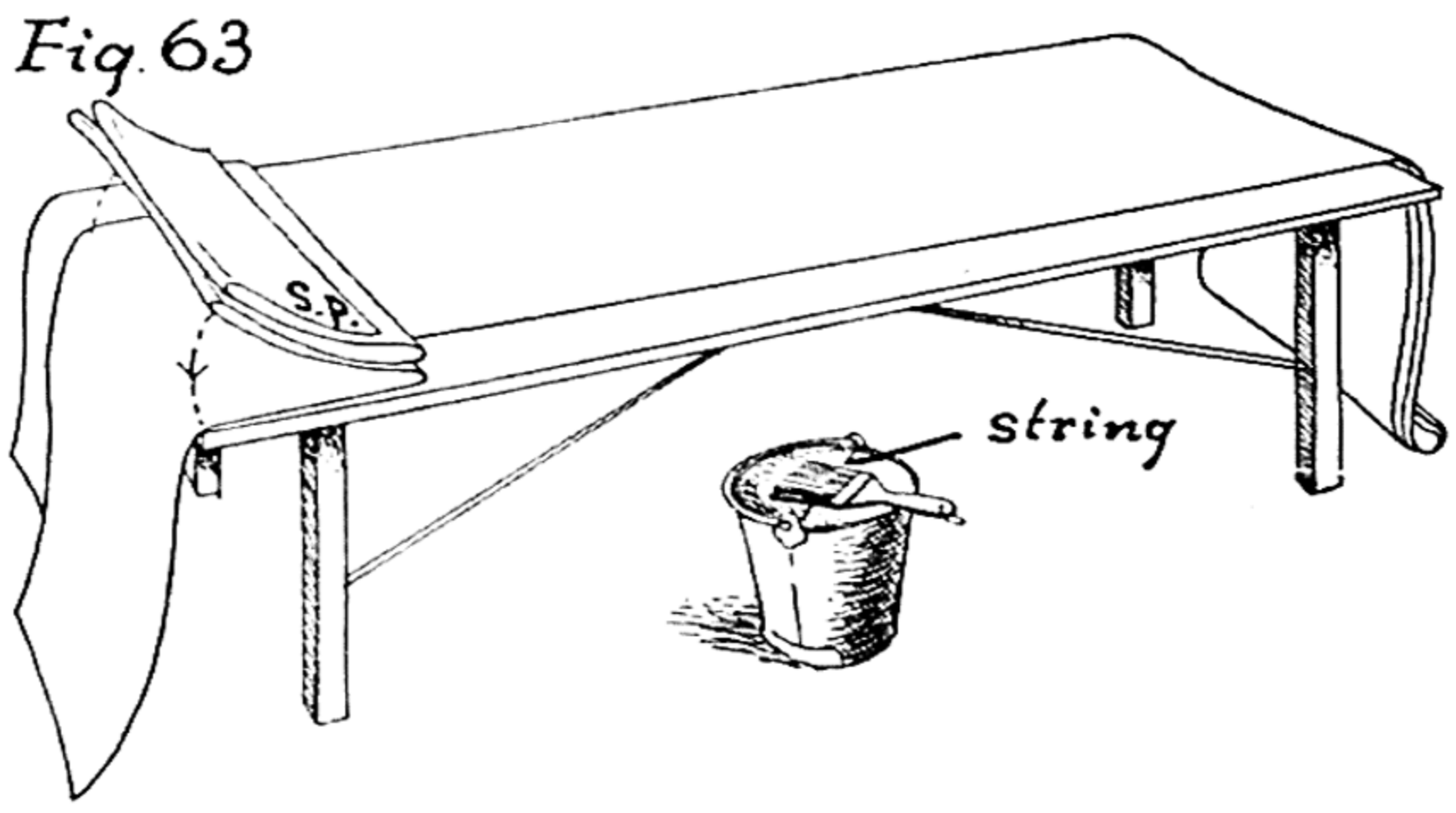


Fig. 63



Folding a length of ceiling paper after pasting. S.P. denotes the starting point

1 inch beyond the angle of ceiling and wall (or cornice) to allow for final trimming. The paper in the left hand should not come into contact with the ceiling, but should be held about 1 inch below and with the matching edge exactly to the guide-line. About 2 feet of this edge is now stuck down with the right hand, sliding the paper to the correct position before attaching the back edge.

Having completed this, the most difficult and important part of the work, we take the papering brush, release another fold, brush lightly down the centre of the length and then to the near edge to ascertain whether the paper is running straight along the line. If so, we may continue, but if not, the left hand is lowered to detach some 2 feet of paper, which is then brushed into position. This is repeated until the material is running straight.

It will be found that by varying the direction and pressure of the brush strokes the paper can be pulled very slightly out of straight. This is useful, but at the same time dangerous if carried too far when fixing the first 4 or 5 feet of paper. A slight twist at this point may increase to ½ inch by the time the end is reached. On the other hand, if the first few feet run straight, the remainder can be brushed down the centre, then at right angles until all the folds have been dealt with and the supporting roll is no longer required for that length.

When the end is reached, mark the angle between ceiling and cornice (with the back of the scissors), pull down about 1 foot of paper and trim off the surplus. Avoid contaminating a distempered cornice with paste, and, in the case of a painted surface, wipe clean with a damp sponge before brushing the paper back again. Return to the starting-point and repeat the process, brushing out any creases when finishing off. In the absence of a cornice the paper is allowed to wrap over

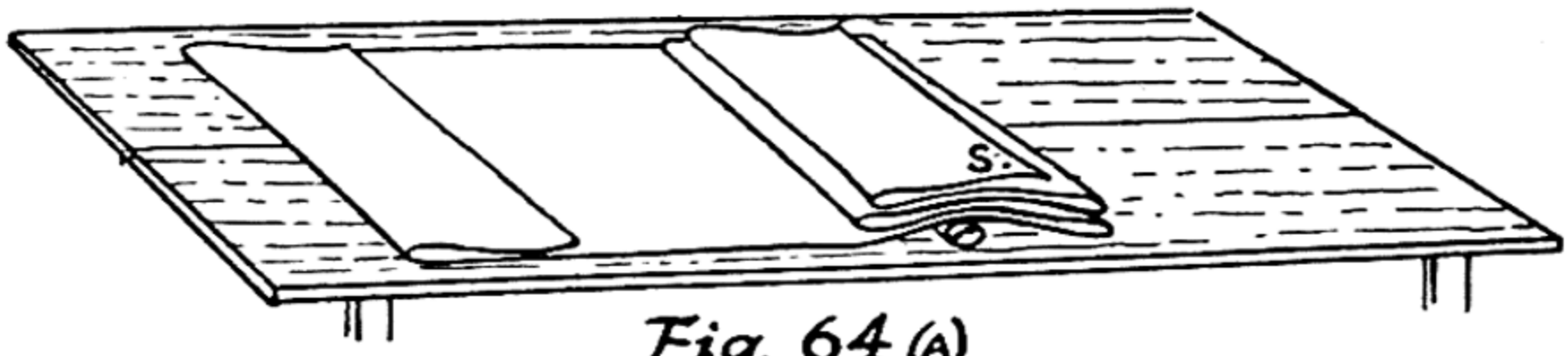


Fig. 64 (A)
Ceiling paper folded ready for hanging
(S) indicates the starting point.

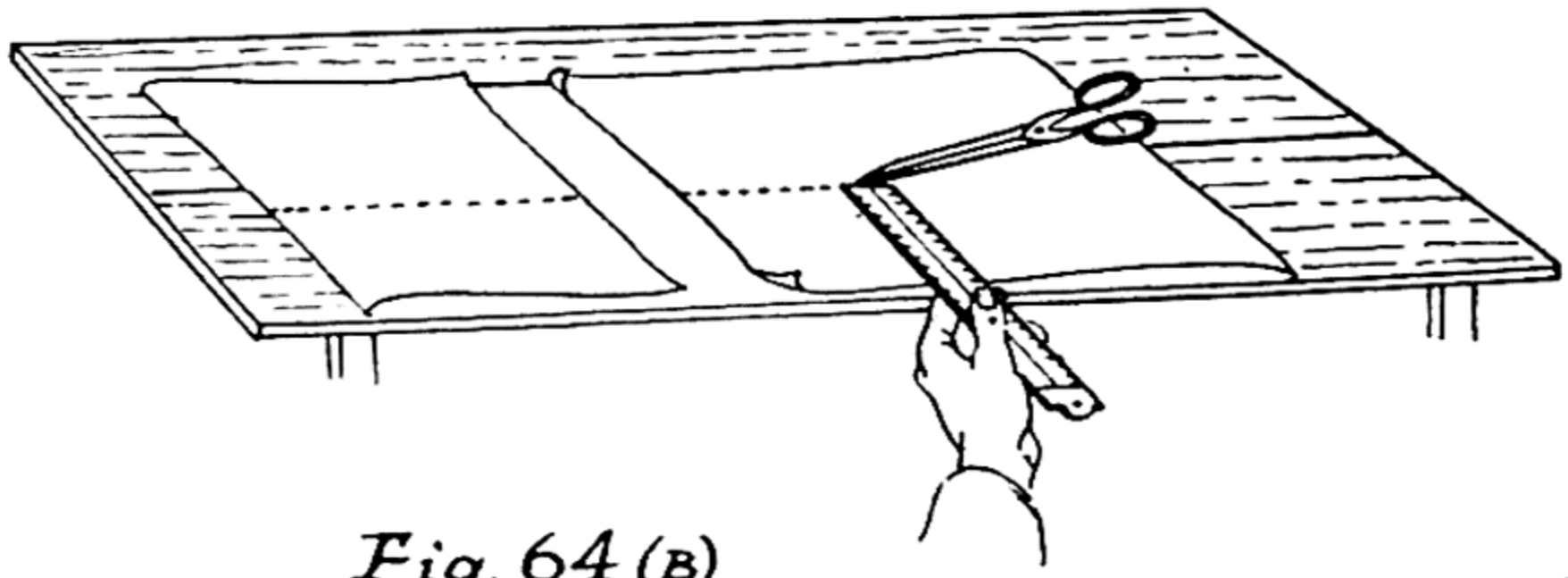
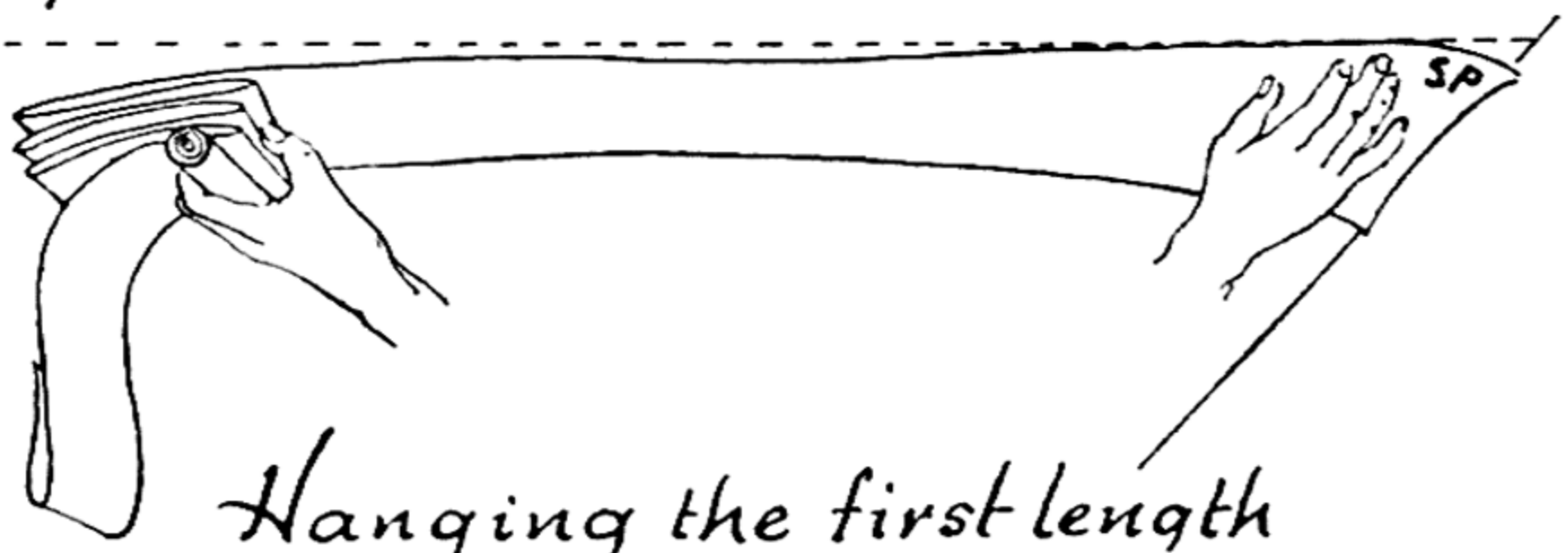


Fig. 64 (B)
Method of folding and marking a pasted length prior to cutting into vertical strips. The index finger should slide along the edge of the bench.



Hanging the first length
to the guide line.

on the wall, to a distance not exceeding ½ inch. Lastly, brush down all edges and angles until secure.

Subsequent lengths are pasted and applied in the same manner, working from right to left in each case and keeping the pattern accurately matched. The last strip of ceiling is usually of a different width, at times very narrow. This means pasting and folding the paper in a manner which facilitates marking and cutting whilst on the bench. If folded as shown in Fig. 64B, with the edge in line with the front of the bench, it is possible to use the 2-foot rule as a gauge, and, with the scissors at one end, to mark the required width along the whole length. This is cut about 1 inch too wide to allow for accurate trimming after fixing.

Obstructions of various kinds may prove troublesome when paper-hanging. An electric-light fitting is generally met with on ceiling work, hence the removal of globe, shade, and other accessories. If these are dismantled in advance, the paper can be perforated, snipped with the scissors, and the lamp-holder and flex drawn through to allow the paper to fall into place (Fig. 65A). The whole length of paper is brushed into position before coming back to scribe and trim round the ceiling rose.

Immediately following the application of each length, examine the surface for paste spots or smudges. If attended to at once, these can be removed with a clean damp sponge and should leave no trace. Another routine matter concerns the disposal of waste trimmings, particularly those wet with paste. On no account must they be allowed to accumulate on the floor, for apart from general untidiness they constitute a real danger.

This subject would be incomplete without some reference to the type of joints employed. A beginner must obviously commence by using the easiest method—*i.e.*, one involving lap joints, which means, of course, leaving

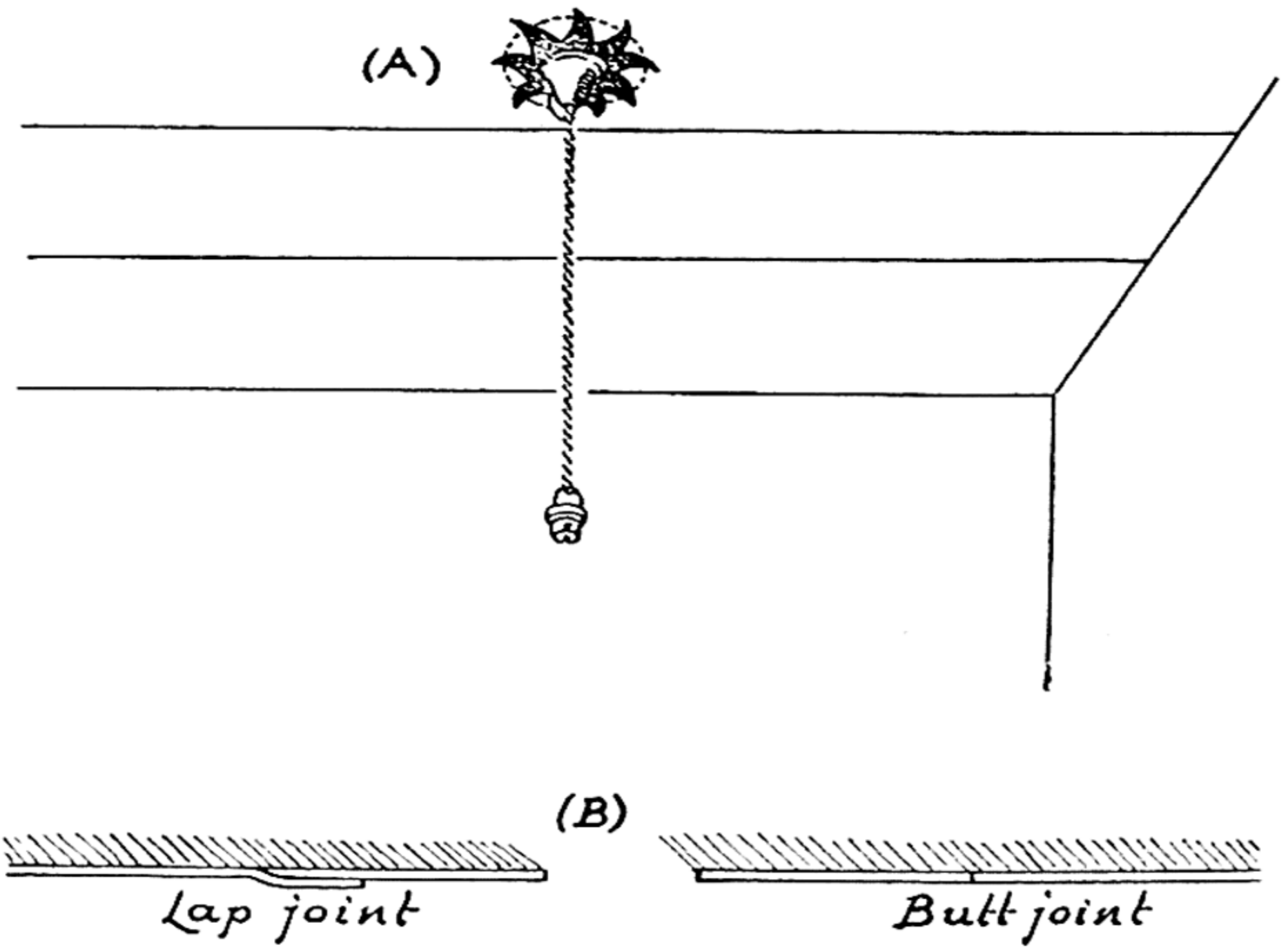


Fig. 65

(A) *Illustrates the method of passing obstructions.*

(B) *Types of joints used in paperhanging.*

part of one selvedge when trimming. When both edges are trimmed clean, a lap joint is out of the question and a " butt " joint becomes necessary (Fig. 65B). This is the type used in the hanging of lining paper and in high-class work generally, but it requires that expert workmanship which develops from care and experience.

CHAPTER V

WALLS

Walls, preparation and decoration in wallpaper, "Lincrusta" oak effects, distemper, and oil paint.—Shading; scrumbling; lining, and stencilling.

Paper-Hanging

We are fully aware that the inclusion of paper-hanging before the painting of woodwork is contrary to good practice. Walls should never be papered until the very last job. And now, having made that point clear, we continue with the subject already commenced, in the belief that this course will facilitate quick reference.

The surface preparation already mentioned is equally applicable to walls. There are, however, certain conditions peculiar to walls which demand attention. Not only must defective plaster be made good as in ceiling work, but this should also include the filling of all cracks in angles between walls and woodwork, particularly along the top edges of skirting boards.

Efflorescence (a white furry deposit) is often found on new plaster, and must be treated to prevent its recurrence. If the powder is dusted off and the surface coated with iron sulphate solution (1 ounce dissolved in ½ pint of hot water) the defect should be cured.

The presence of oil or grease is certain to stain or otherwise damage superimposed paper, paint, or distemper. Greasy surfaces must be washed thoroughly with a strong solution of sugar soap and well rinsed with dilute vinegar (one part of vinegar to fifty parts of water). When dry, the doubtful surface is sealed by a coat of thin knotting.

Dampness cannot be cured from the inside of a building,

but there are several precautions which might well be taken after an attempt to remove the cause. Allow the part to dry out, or speed up the action with a blow-lamp, and coat the patch with anti-damp solution. When dry, paste a length of pitch paper (pasting the black side), fold as if for cutting into strips (Fig. 64B), moisten the outer side with clean water, and apply to the wall. The edge can be bevelled by glass-papering before hanging the final wallpaper.

Oil-bound distemper requires little preparation other than sponging down, and perhaps some scraping here and there to remove dust and flaking material. Sizing is only necessary upon very porous parts, and, of course, for touching-up any patches of new plaster.

Varnished wallpapers should be treated as painted surfaces—*i.e.*, washed and rubbed down to a matt finish, raised joints to be levelled with No. 2½ glass-paper, and the whole wall sized and cross-lined. Varnished papers can be scraped off after soaking with caustic paste (see p. 88) and then with hot water, but this tedious and messy job is rarely necessary unless a heavy material, such as "Lincrusta," is to be applied.

Limewashed walls should be scraped, brushed down, stopped, and sized, before the application of wallpaper.

Previously papered walls can be re-papered without stripping, providing that the conditions applicable to ceilings (see p. 148) are observed. It is not a difficult job to reduce the raised edges of butt joints by glass-papering and the same process is often successful for the chamfering of border edges, but to neglect this point may spoil the job. It is risky to hang pale wallpapers directly upon others containing strong reds or blues; deep colours sometimes stain a superimposed paper. Then there is the all-important question of hygiene; to re-paper without stripping off the old material rarely gives the

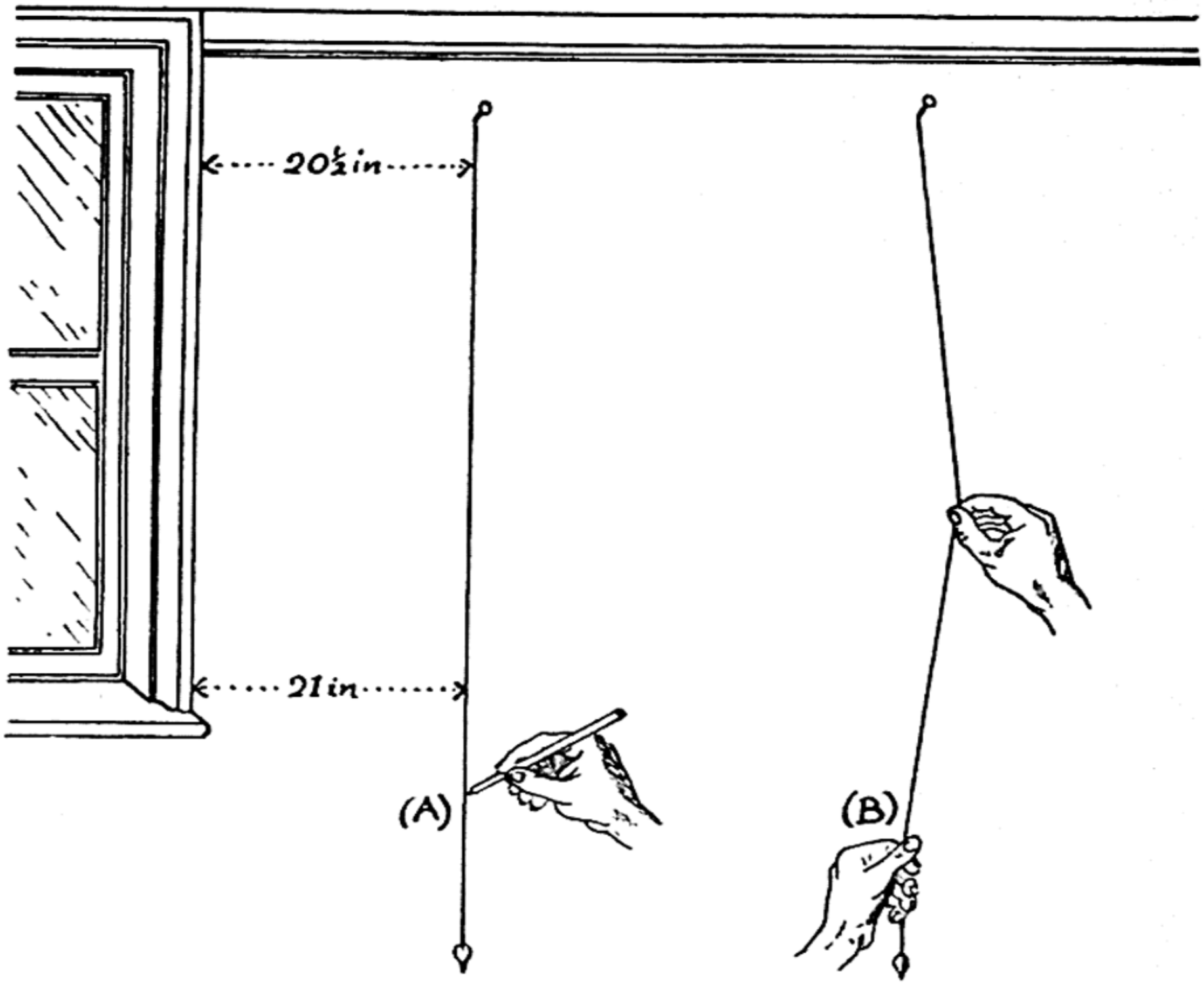


Fig. 66

Marking out a guideline for the first length of wallpaper. This procedure is advisable when the window is not vertical.

The position of the chalked string is marked with a pencil (A), then held firmly (B), and flicked sharply to "strike" the required chalk line.

degree of satisfaction associated with the more thorough job.

Measuring-Up and Setting Out

First measure the height of the walls and calculate the number of lengths obtainable from each roll of paper. A wall 7 feet in height, plus 6 inches for waste and matching of pattern, will require one roll of paper for every four lengths, but there is a surplus of 4 feet which may be useful when papering over doorways, under windows, etc. In the case of a 9-foot wall, each roll produces three lengths and leaves a remainder of 6 feet, and so on. By counting the number of previously applied lengths (before stripping), or by measuring the perimeter of the room with a 21-inch rod, our requirements can be ascertained.

It is usual to make an allowance for border, such allowance being determined by the width or type to be employed. If, for example, a 5-inch border is to be hung around the top and base, we should leave a $4\frac{1}{2}$-inch strip of bare wall to receive the border. In panelling, a similar allowance is made for vertical strips. Cut-out borders with their serrated edges obviously demand special attention; the part left unpapered must conform to the narrowest width.

"Setting out" consists of marking out the position to be occupied by straight borders, panelling, and, in some cases, the position of the first length of wallpaper. This can be done with coloured chalk or charcoal, horizontal lines being struck with a chalk-line (see p. 178) and vertical lines with the aid of a plumb-line (Fig. 66). This is a great help during the application of wallpaper; the coloured chalk being transferred to the back of the paper facilitates accurate trimming of tops and bottoms of the various lengths.

The papering of walls should follow the same direction as in ceilings—*i.e.*, always working away from the light. This means commencing at one side of the window and working round to an angle, doorway, or other convenient break on the opposite side of the room (Fig. 67). This procedure is repeated from the other side of the window and, since this necessitates the trimming of right- and left-hand selvedges respectively, the finishing-point must be decided in advance.

Large patterns should be centred on the chimney breast and also on walls to be panelled, the slight waste incurred being amply justified by the perfect balance secured. In the absence of panelling it is usual to mark the centre of the chimney breast and then measure the number of 21-inch lengths between that point and the window (Fig. 67A). In all probability the last length will fall short of the window by perhaps 1 foot, and it is at this point (Fig. 67B) that we strike a vertical line (Fig. 66) which serves as a guide for the right-hand edge of the first length to be hung. Subsequent lengths are applied, working from right to left until the finishing-point (Fig. 67C) is reached.

To hang a plain or small-patterned paper we commence by testing the window casing with a plumb-line. If this is truly perpendicular it forms a ready-made guide for the first length, if not, we can strike a line at 20 to 20½ inches away from the window and use this as a starting-point for papering. The first length can be applied on the right or left of the guide-line as desired.

Cutting and Folding

Generally speaking, the matching and cutting of wall-papers differs only slightly from the method adopted for ceiling papers. Patterned paper must be examined carefully to ascertain which is the right way up—at times

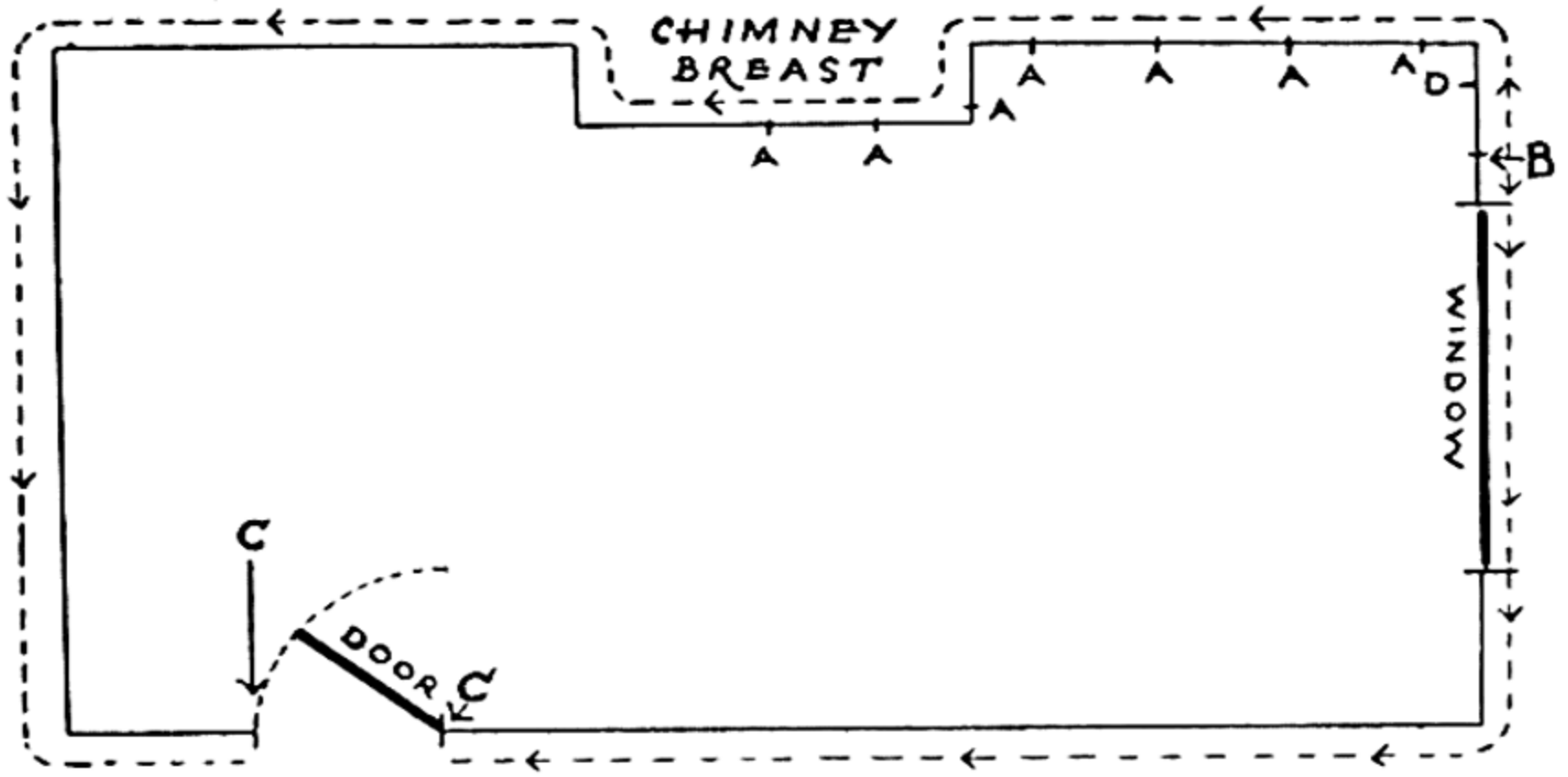


Fig. 67 A Papering the walls of a room.

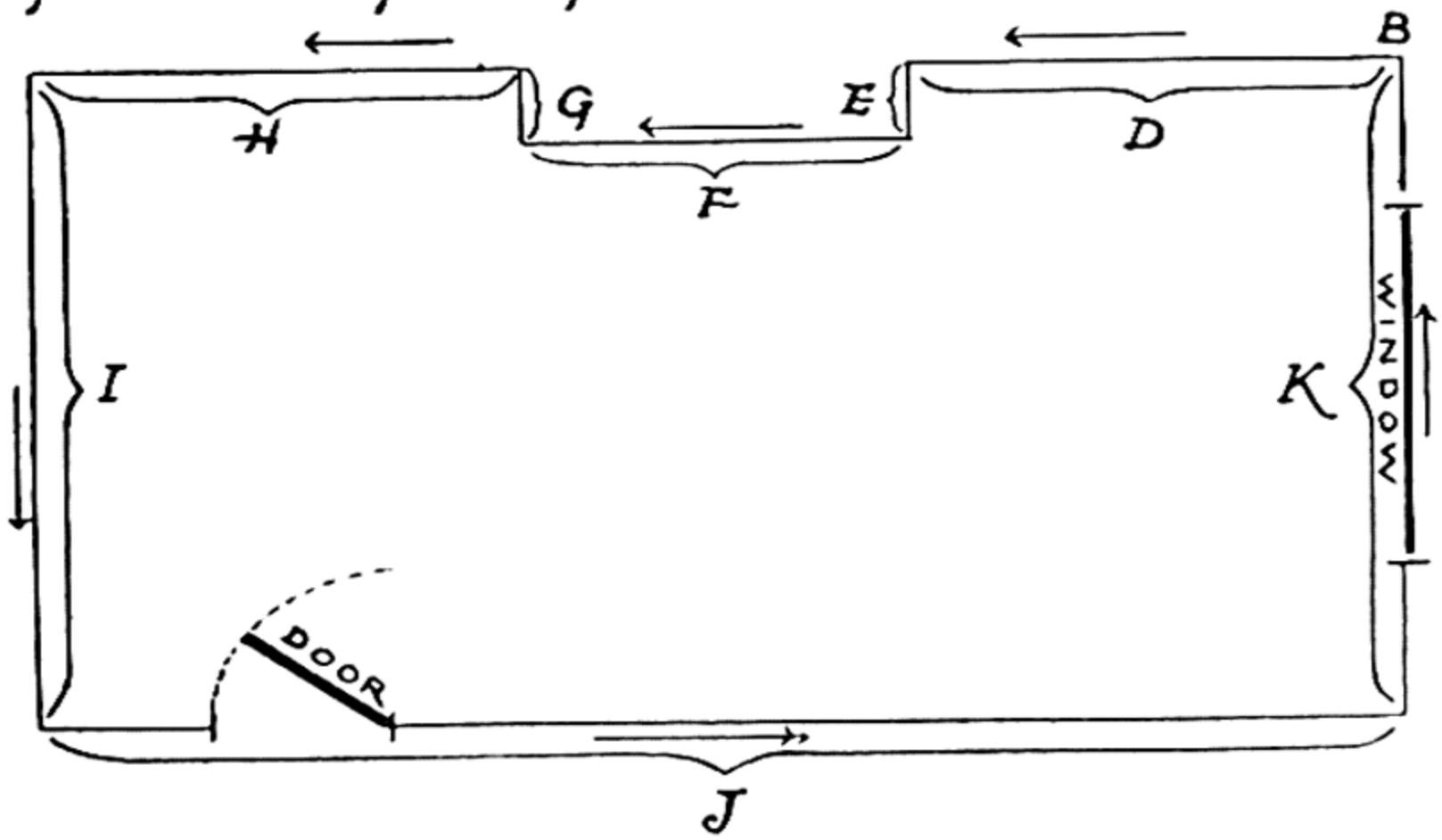


Fig. 67 Papering a frieze.

These diagrams illustrate the order of sequence and directions followed when papering the walls of a room.

rather difficult to decide. Observe the direction followed by floral patterns; in most cases this conforms to the normal upward growth. In doubtful cases note the disposition of high lights and shadows, and hang the paper with high lights uppermost.

See that all the rolls are of exactly the same tone and colour before trimming, and note any instructions printed upon selvedges. Semi-plains frequently display one or more of the following: "Trim well in"; "Reverse when hanging"; or, in a few cases, arrows bear the instructions "Join here," indicating a definite repeat which would otherwise pass unnoticed.

The latter must be cut into the required lengths and one or two matching points snipped with scissors (or otherwise marked) before trimming off the selvedges. Reversible papers are reversed whilst cutting into lengths, thus enabling the paper-hanging to proceed in a straightforward manner. Patterned papers are arranged face upwards with the top to the left of the bench. Cut to obtain a complete pattern at the top, for there is nothing decorative about a series of beheaded patterns running parallel with a ceiling or picture-rail. Finally, turn the lengths face downwards with the top at the right-hand edge of the bench.

Frieze papers are always trimmed along the edge which adjoins a cornice or ceiling. Measure and cut out the long lengths first, beginning with *I*, *J*, and *K* (Fig. 67), and turn these face downwards before cutting the short lengths *D*, *E*, *F*, *G*, and *H*. All should be cut about 2 inches longer than the measured space. This method enables short lengths to be obtained from pieces left over from longer lengths. Furthermore, when the short pieces are uppermost pasting is facilitated.

The pasting and folding of a length of frieze paper is carried out in the special manner adopted for all hori-

zontal hangings. Arrange the paper with trimmed edge flush with the front edge of the paste-bench, then commence pasting, working from left to right and folding as shown in Fig. 68A. In the case of short pieces, the method in Fig. 68B is more suitable.

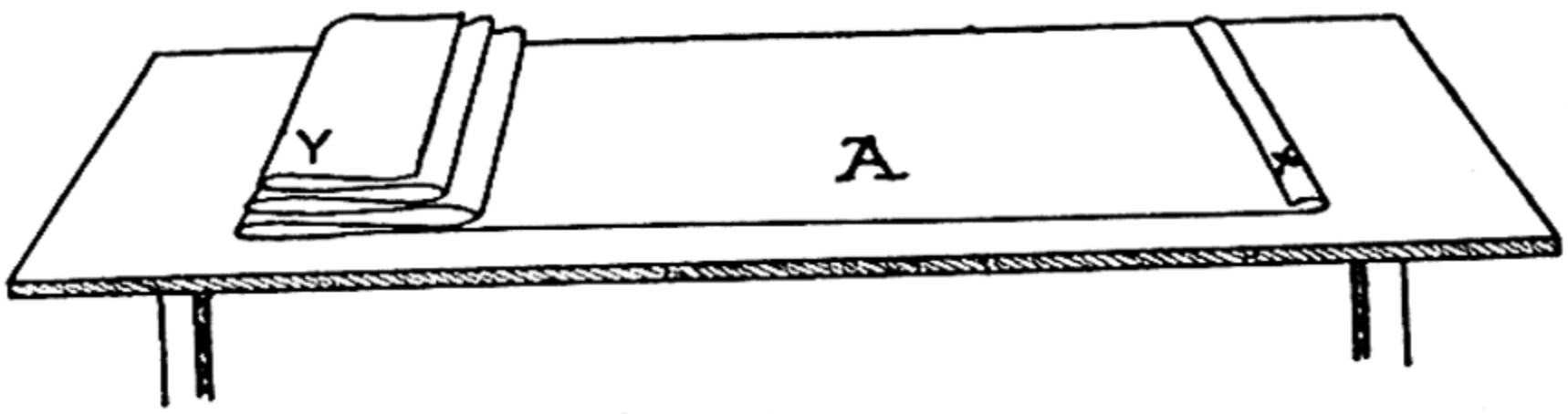
Lengths of wallpaper are arranged with matching edges to the front, but pasting is commenced at the top (right) end and folding is completed as in Fig. 68C.

Paper-Hanging

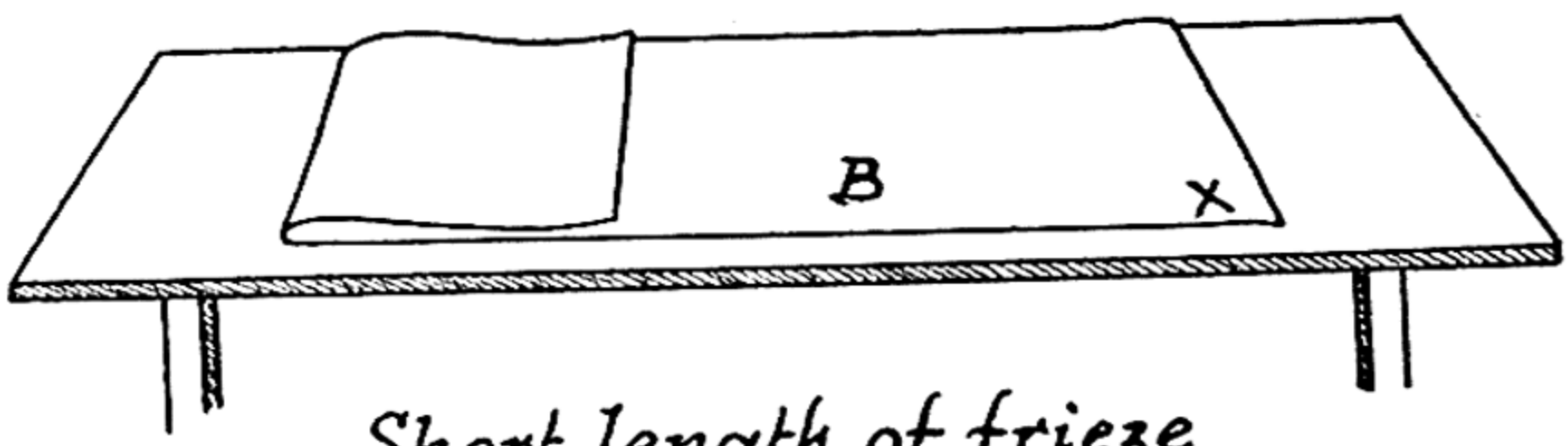
In papering a frieze we require steps, plank, tools, etc., as for ceiling work (see p. 178). Commence by hanging the short length at *D* (Fig. 67), working from right to left and allowing the paper to overlap on adjacent walls to a distance of about $\frac{1}{4}$ inch. Brush out all creases and make certain that the paper is firmly attached at edges and angles. If the latter are not straight it may be necessary to make a number of small snips at the extreme ends of the paper and so enable these parts to fit more firmly.

Continue with the hanging of remaining short pieces at *E*, *F*, *G*, and *H* (Fig. 67), and then paste the first long length for application to wall *I*. Fold as shown in Fig. 68A, with the extreme end *X* turned over to give a 1-inch fold. Take hold of the length at points *X* and *Y* on the near edge and convey to the hanging position adjoining *H* (Fig. 67).

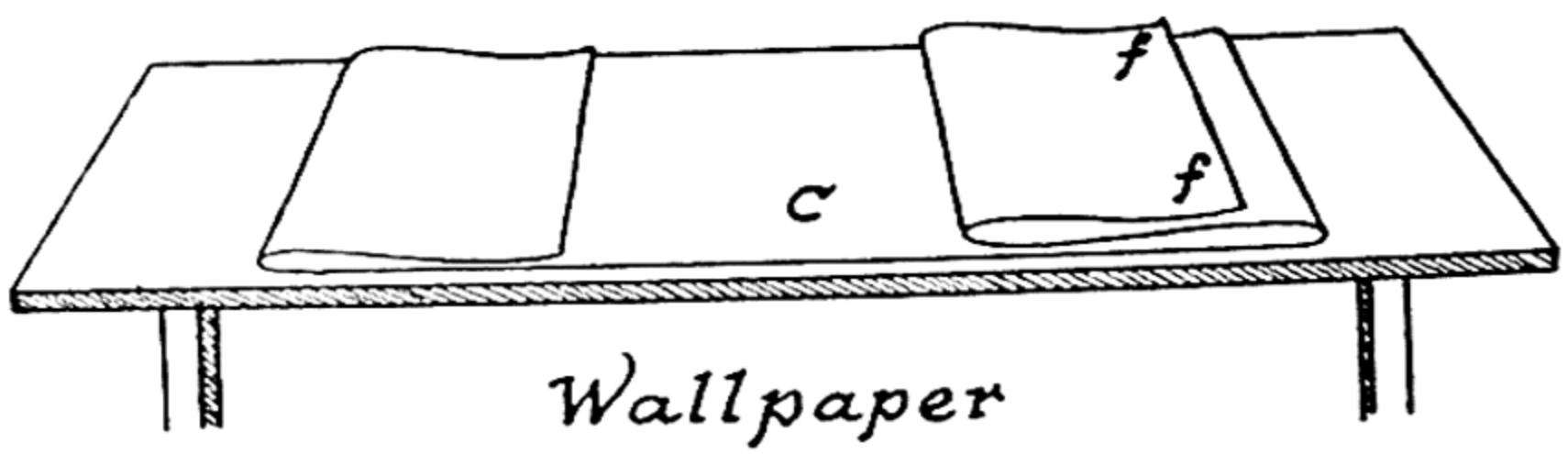
Hold the paper so that fold *X* meets the angle, and the top edge adjoins and runs parallel with the cornice (Fig. 69). The left hand, which supports the paper at *Y*, is held away from the wall but level with the cornice until the top edge of the paper is attached; follow by downward strokes with the papering brush to smooth out creases. Release the folds, one by one, and brush horizontally from right to left, at the same time noting



A long length of frieze paper



Short length of frieze



Wallpaper

Fig. 68

Various methods of folding wallpaper in readiness for hanging.

the run of the paper. This is almost certain to rise or fall, and must be countered by varying the direction of brush strokes.

If the paper tends to curve downwards, it will be necessary to detach some 3 or 4 feet and to brush this back into position with diagonal strokes in an upward direction. Do not apply too much pressure or the paper will tend

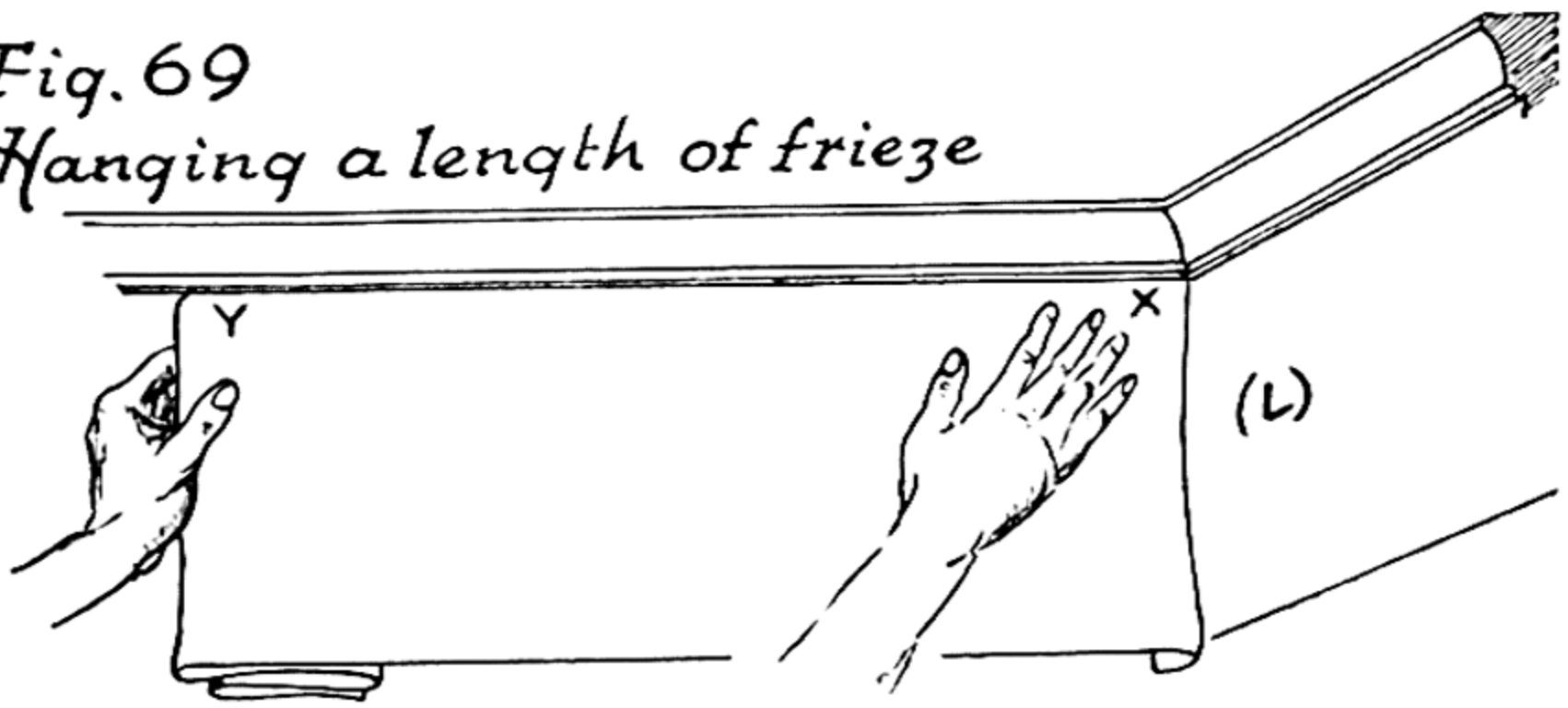


Fig. 69
Hanging a length of frieze
The matching end (X) is kept folded until trimming is completed, this ensuring that the previous length (L) is not marked with paste.

to curve upwards. As each fold is applied, see that all creases are removed by vertical brush strokes and that edges are securely fixed. Lastly, attend to the trimming of ends, allowing a slight overlap at the left-hand angle, but fitting the starting-end neatly into the corner. The fold at *X* should remain folded throughout to avoid soiling the adjoining length.

Wallpaper is pasted in a right to left direction and folded as in Fig. 68c, but with 1 inch at top and bottom left dry to facilitate handling. The pasted length is lifted at

points *f.f.* and carried up the steps near the guide-line (see Fig. 67B) which marks the starting-point. Grip the dry margin at *f.f.*, and, with one knee raised to take the weight, release the upper fold. The paper will slide across the knee and straighten out without tearing, and in this position is ready for hanging.

As we intend working from right to left, we hang the right edge of the paper to the vertical line, and, until the upper half of this edge is accurately fixed, we can keep the left edge away from the wall and thus ensure greater freedom of movement. Use the brush vertically along the centre and then horizontally, climb down the steps and unfold the remaining portion of the length, again brushing down the centre and then outwards. See that the paper is perfectly upright before trimming at top and bottom, and sponge any paste off adjoining paintwork before continuing with the next length.

Subsequent lengths are applied in the same manner until a wall angle has to be negotiated. This length is pasted, folded for cutting (see Fig. 64B), turned round so that the matching edge is flush with the front of the bench, and then marked along its length (see p. 185) ready for cutting. The width of the required strip must be measured carefully at top, middle, and bottom to test the angle for accuracy. If one wall is out of plumb the measurements will vary, and we must take the greatest and add $\frac{1}{4}$ inch to wrap over upon the next wall. Internal and external angles are treated alike, but having turned the corner it is most important to make sure that the first length (or part-length) is hung perfectly upright—a plumb-line is easily improvised.

Where butt joints (Fig. 65B) are used, these can be improved by rolling each joint with a chair castor—a job which should be done about half an hour after hanging. Excessive rolling may result in shiny joints, but this can

be offset by protecting the wallpaper with a strip of thin paper whilst the operation is carried out.

A broad, felt-covered roller is employed in the hanging of certain types of paper which are liable to be scratched or otherwise marked by brushing. The roller is particularly necessary for the application of delicate-tinted satin papers and also for others printed in loosely attached colours. Embossed materials would obviously be flattened out by rolling.

Some papers, especially the tile and marble effects used in bathrooms, are slightly transparent and should therefore be applied over a lining paper. Stout wallpapers are more easily applied than those of a thin, pulpy nature, but it should be remembered that a heavy paper should be allowed to soak for about five minutes after pasting, then, when pliable, it can be hung without difficulty.

It is usual to paper the walls of a room and then to fill in the odd strips adjoining doorways, fireplaces, etc. These should not be allowed to exceed about 8 inches in width, otherwise the joint may show prominently in the finished work (Fig. 70A). This can be avoided by working round a doorway as shown in Fig. 70B.

Panelling

Panelling usually enchances the appearance of a well-proportioned and not over-furnished room, providing that a straightforward scheme is adopted. Two simple arrangements are shown in Fig. 71. Scheme (*a*) consists of a 7-inch stiling border which is cut in half and applied round the top, bottom, and angles, to give one panel on each of four walls; the vertical stiles being applied last. Note the cutting of mitres and see that each strip is plumb upright. A variation (Fig. 71B) of this arrangement will give additional interest.

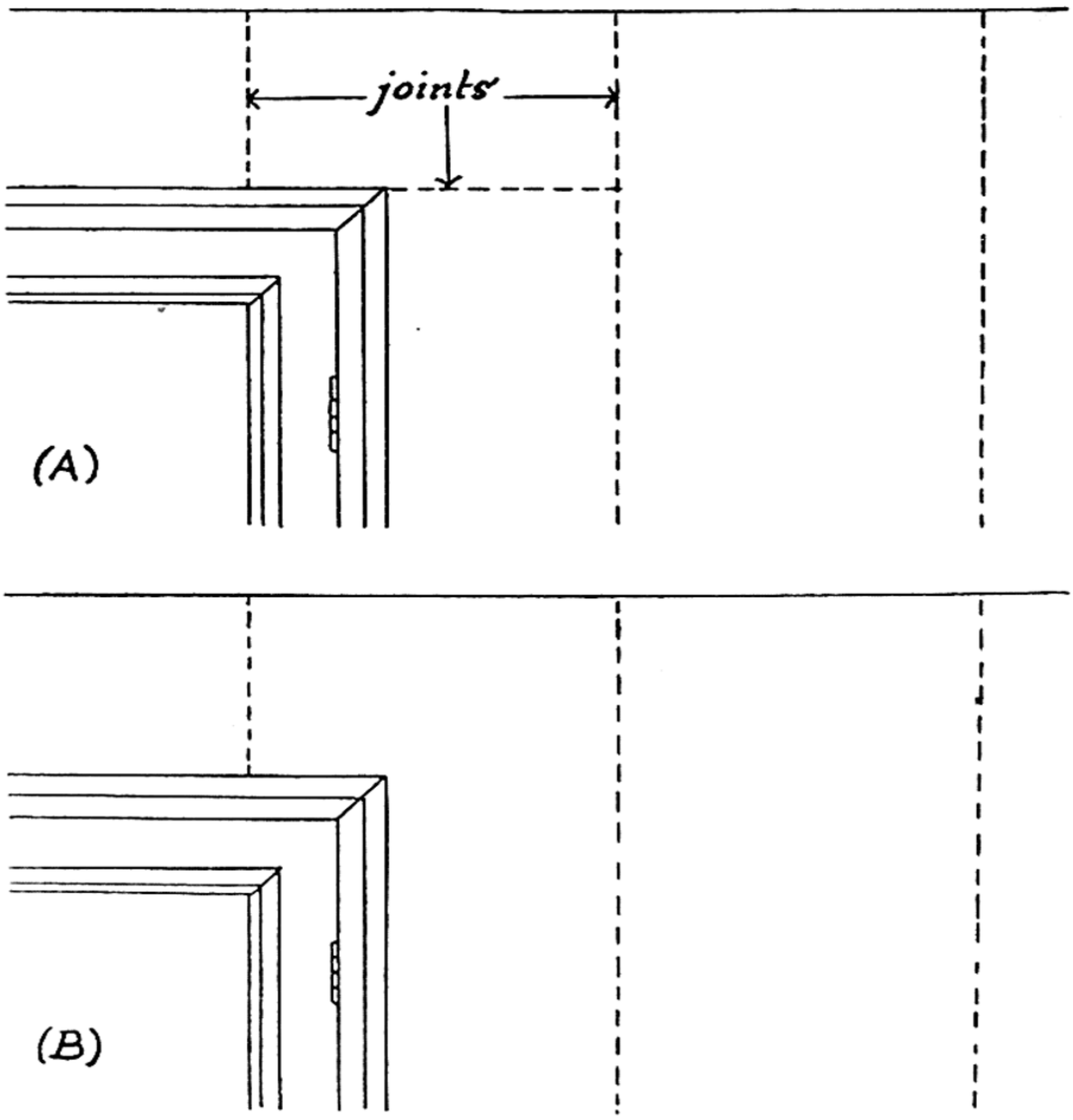


Fig. 70

Methods of passing a doorway
(B) illustrates the correct procedure

Scheme (*c*) requires a full-width border of 5 to 7 inches. The effect is bold, simple, and well adapted to rooms where the absence of a picture-rail makes scheme (*a*) impracticable. Horizontal strips are applied first, using a guide-line—checked by spirit level and straight-edge—at frieze level. Then apply vertical stiles, two to each wall, at measured and equal distances from the angles. To obtain the best effect these upright stiles should be placed with due regard to the disposition of furniture; they should not be obscured.

Cut-out borders can be used to advantage upon plain and semi-plain wallpapers. If these are cut into single borders, pasted, and folded as for cutting, the perforated edge is more easily removed. Be particularly careful to sponge off any paste which inadvertently soils the face of wallpaper beneath, but do this carefully lest the colour or pattern be damaged—the majority of wallpapers are printed in distemper colour.

Embossed Materials

These include a wide range, from the low-relief imitations of stamped leather to comparatively high-relief patterns and borders reminiscent of modelled plaster. Probably the best known are the intermediate group, "Anaglypta," and "Lincrusta–Walton," the first-named providing semi-plain, plastic, border, and all-over patterns suitable for ceilings, friezes, and walls. "Lincrusta" is a solid relief material used mainly upon wall surfaces. The varieties include excellent reproductions of plain and panelled oak, mahogany, and other woods, as well as linen, damask, and other decorative effects.

Surfaces must be prepared as for paper-hanging, the job to be thoroughly executed to produce a firm and level surface. The flour paste can be improved by the addition of a little glue and, if lumpy, should be passed

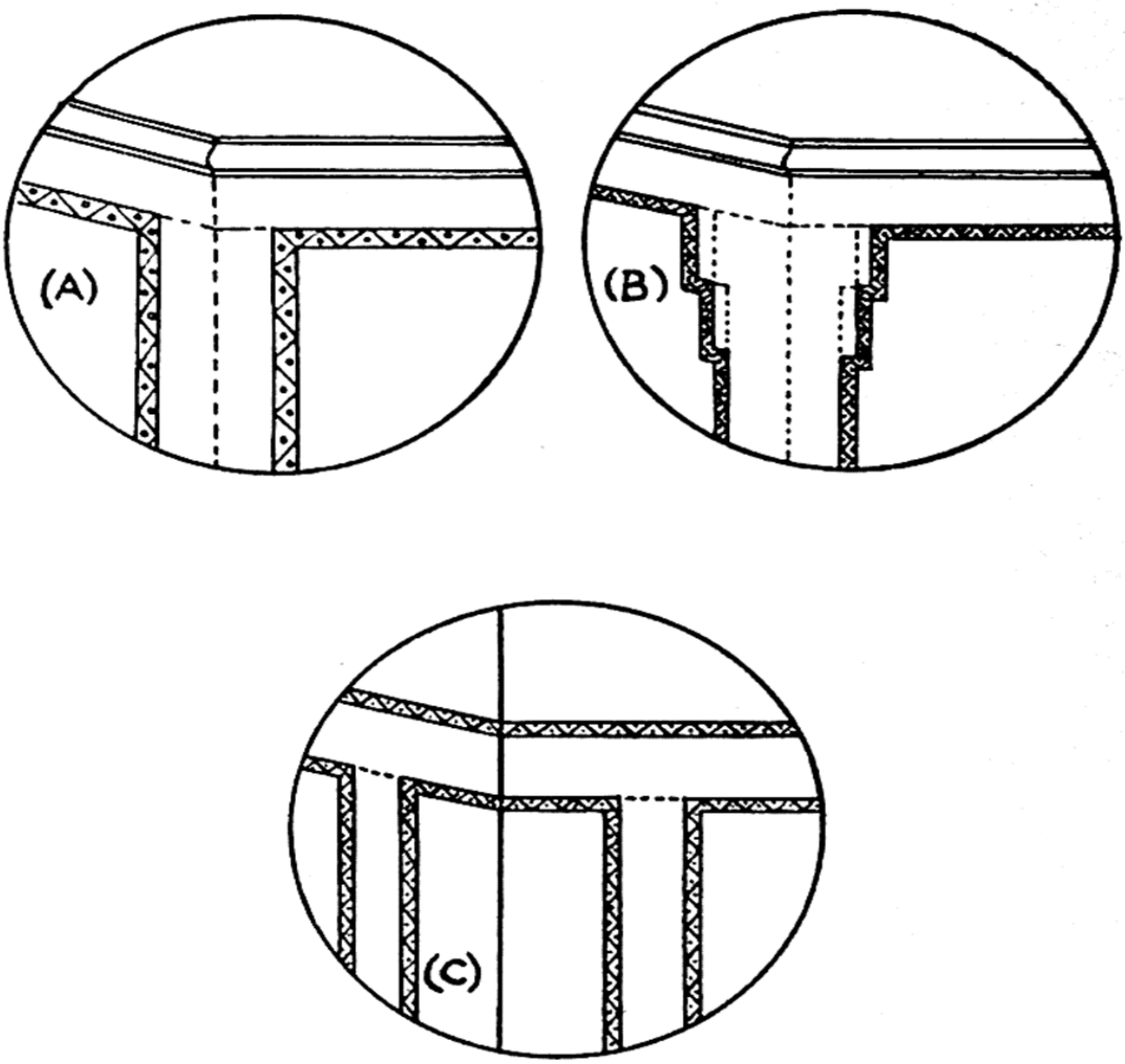


Fig. 71

Various methods of panelling a room

Joints are indicated by dotted lines

through a coarse sieve. Trimming must be absolutely accurate, and for this purpose a shoemaker's knife and steel straight-edge are necessary. The material is placed on the paste-bench, face upwards, with a strip of zinc beneath the section to be trimmed; a straight-edge is held flush with the faintly embossed guide-line and the selvedge removed by one or two strokes with a sharp knife.

The paste is used as thick as possible and, in the case of "Anaglypta," two or three lengths can be pasted, folded as for cutting, and put on one side to soak. The first is then re-pasted, folded, and applied as in paper-hanging, taking great care throughout that the embossed pattern is not flattened in hanging or damaged when folding. It will be obvious that the papering brush must be used with care. Each length is firmly secured by pressing the flat areas with a clean, damp cloth. Any paste exuding from the butt joints must be sponged off.

"Lincrusta" requires a slightly varied treatment. The side to be pasted is soaked by sponging with warm water, dealing with two or three lengths at a time as with "Anaglypta." These are pasted as required and hung when slightly pliable. Because of its solid nature it is better to use a roller to press out air-pockets—always working from the centre outwards. Take great care when marking and trimming off surplus at top and bottom, lest the material be broken.

If the material is well trimmed there should be no difficulty in obtaining flush and perfect joints. These should be sponged down to remove paste. The negotiating of angles is likely to prove troublesome, particularly in the case of sharp external angles. Here the material must be made to turn the corner without breaking, and wrap over to a distance of $\frac{1}{2}$ inch on the adjoining wall. To get over this difficulty, the face side of the part

concerned can be softened by the application of heat (sponging with hot water) until sufficiently pliable. Internal angles do not present such problems, the material being cut to fit precisely into the angle.

This material can be obtained as a plain wood effect to be panelled after application. There is a good selection of plain and ornamental mouldings, and reproductions of carved oak, which can be arranged to give simple or complex schemes as desired. Mouldings should be mitred with care and on the lines adopted by carpenters (Fig. 72). The chief rails and stiles are cut, pasted with dextrine gum (obtainable, with instructions, from wall-paper merchants), allowed to become tacky, and then fixed in position. Short lengths are cut, mitred, and tested for accurate fitting, before being pasted. Dextrine is too stiff for brush application, but is easily applied with a small palette knife.

Distempering

As the general preparation and order of procedure have already been given in detail (see p. 148), we can at this stage consider ways and means of enhancing the decorative value of distempered walls. Some form of washable distemper should obviously be used in preference to size-distemper. The surface is smooth, firm, and ideal as a background for the reception of simple decoration in distemper or flat oil paint. Furthermore, a washable material enables walls to be completed before the application of a final coat of paint upon woodwork —picture-rails being an exception.

In size-distempering, it is advisable to finish the edges of adjoining woodwork before coating the walls. Distemper can easily be sponged off the dry paint, but oil paint soaks into the more porous material and usually leaves an oily stain round the edges.

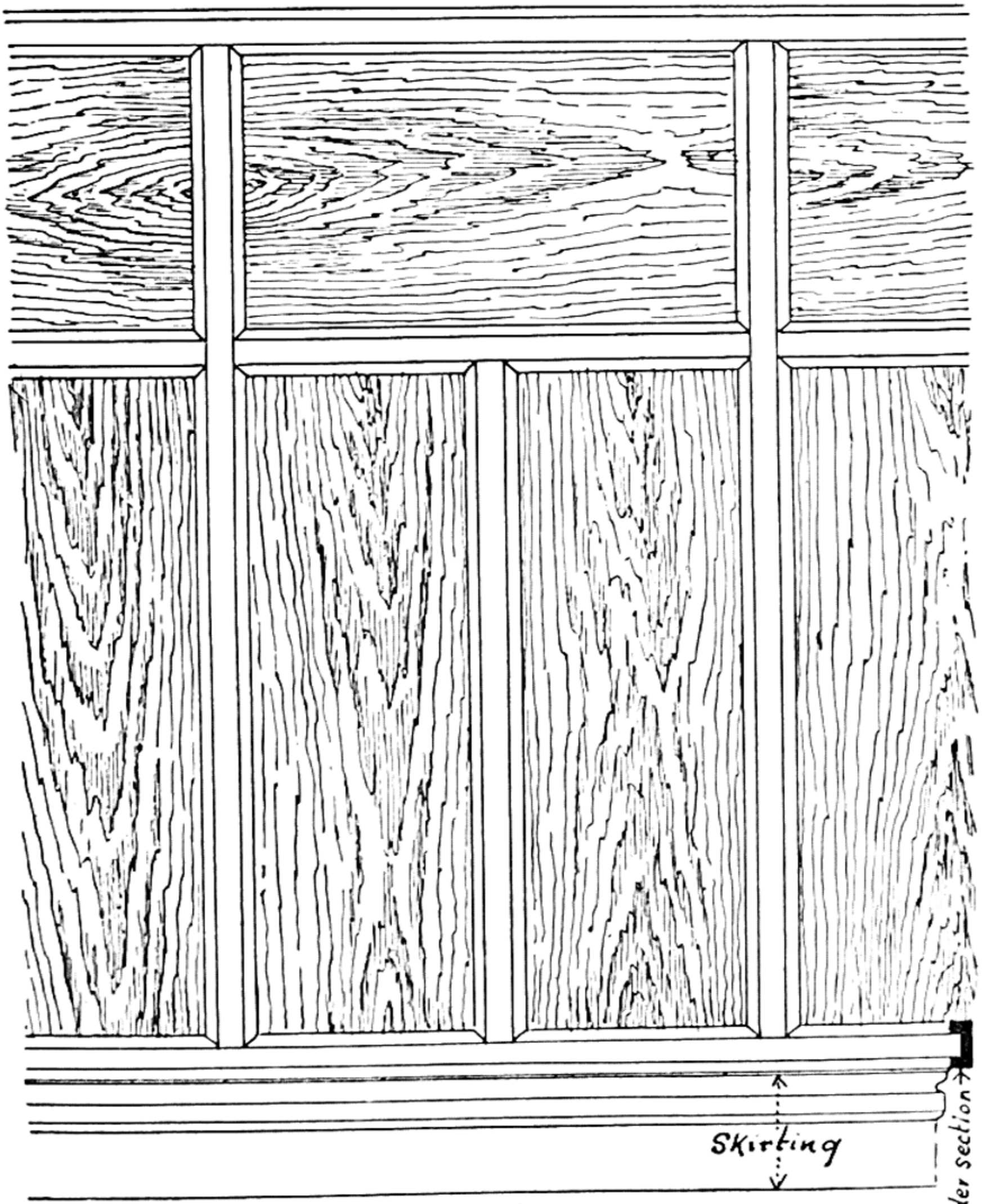


Fig. 72
A panelled oak effect, suitable for a hall, staircase, or dining room.

The walls of a room can be commenced at any convenient angle and coated in a right to left direction throughout. Two brushes are required; a 1-inch brush, or flat fitch for the painting of edges, and a large distemper brush for the main areas. Coat each wall in a series of vertical strips 2 feet wide, working from top to bottom in each case and taking care that each is joined to the previous strip whilst the edge is wet. As each wall is completed, sponge off any splashes on woodwork or floor. Brushwork is similar to oil-painting, the work being "crossed" and "laid off" vertically.

Stippling

Stippling with a clean, soft brush (see p. 162) assists the even distribution of oil-bound distemper, but, to be effective, it must follow immediately after the colour is applied—clearly a job for two men, and one which would be very difficult upon the more rapid drying size-distemper.

Sponge stippling can be applied in a leisurely manner to produce pattern on the dry surface. One or more colours can be employed (one at a time) until the desired effect is produced. To be successful, the work should be carried out in harmonious colours of the same tone —*i.e.*, neither lighter nor darker than the background. To apply dark tones will almost certainly result in an uneven, patchy finish.

There is no hard and fast method for the production of mottled or broken-colour patterns. These can be obtained by stippling with a coarse, ragged sponge; crumpled paper, hessian, or other stiff material, or by means of a special printing roller and feed brush. The general principle is the same in all cases, pattern being formed by printing in distemper colours.

A good effect is obtained by using two colours prepared

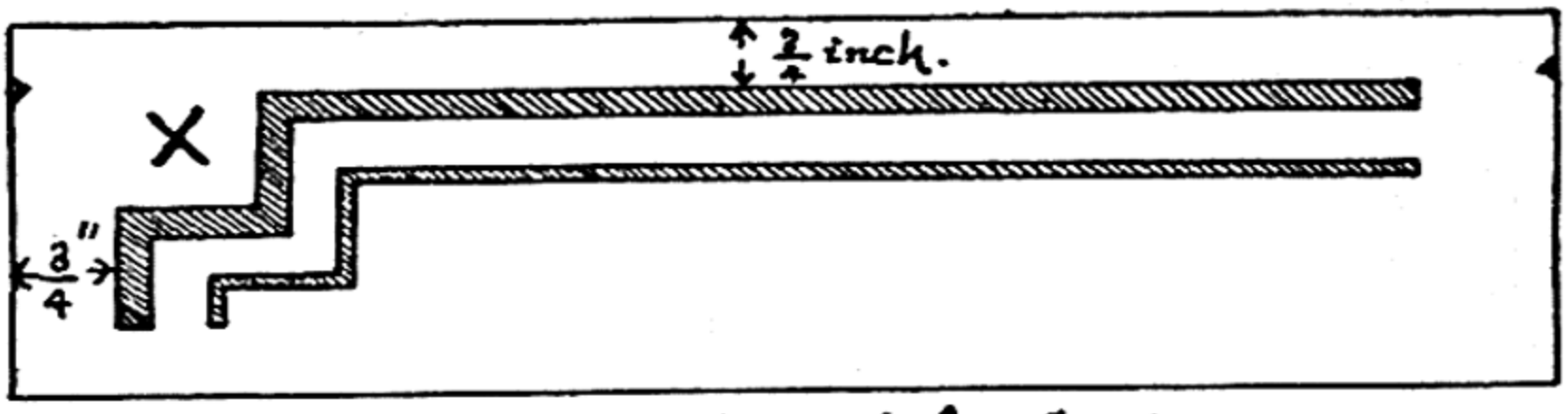
by tinting a little of the ground colour. If the background is primrose, add a touch of blue to produce yellowish-green and, in a separate paint kettle, tint an equal amount with red, brown, orange, or black to obtain the slight variation required. Both tints are prepared from a common base (primrose) and are thus related and in perfect harmony, a procedure which applies equally to whatever ground colour may be used.

These tints are applied much the same as in stencilling —*i.e.*, an old brush is used to convey a small quantity of colour to the palette board, from whence it is picked up with a sponge and transferred to the wall. By this method it is possible to control the amount applied and secure greater uniformity. When using hessian or paper, see that the printing face remains crumpled throughout the operation. Avoid heavy pressure, which flattens this face and results in coarse pattern. Wash the palette board and sponge before commencing with the second colour.

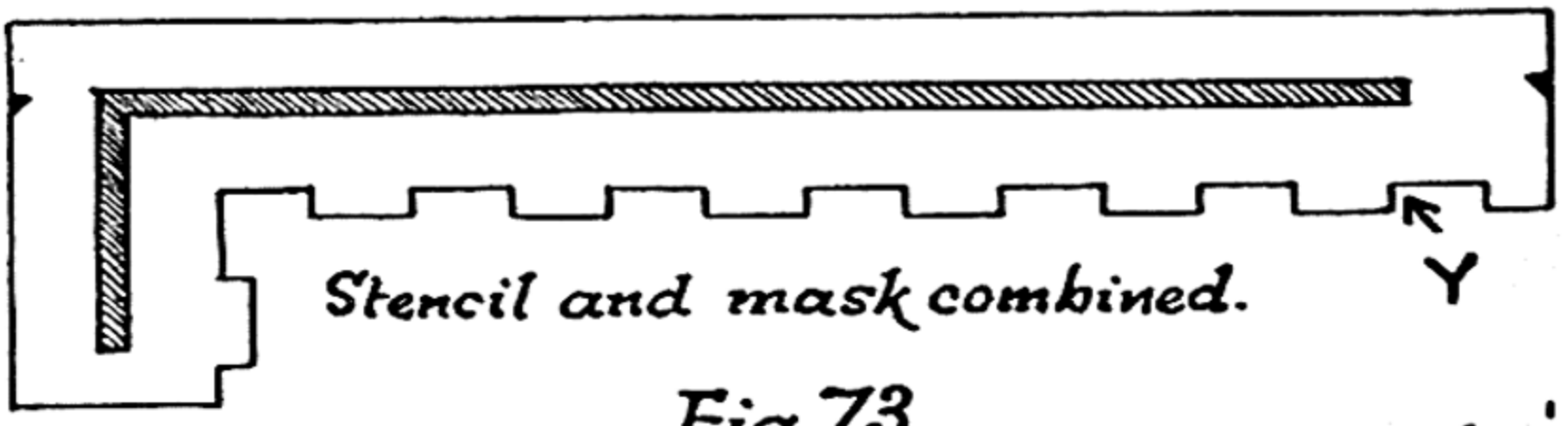
Lining

The ability to paint a straight line is of the utmost value in decorating. Lines can be made to change the whole appearance as well as the apparent proportions of a room, and, if neatly executed, can do much to relieve the plainness of the walls. When used at dado height, a neat line provides a useful means of separating two colours or—when walls are finished in oil-bound distemper—forms a suitable break if the lower half is to be varnished. The panelling of walls can also be carried out in single, double, or shaded lines as desired.

Lining may be carried out upon distempered and painted walls by means of (*a*) a stencil, (*b*) mask or template, or (*c*) direct painting with a fitch and straight-edge; the latter being the only method outside the scope



a simple stencil for lining.



Stencil and mask combined.

Fig. 73

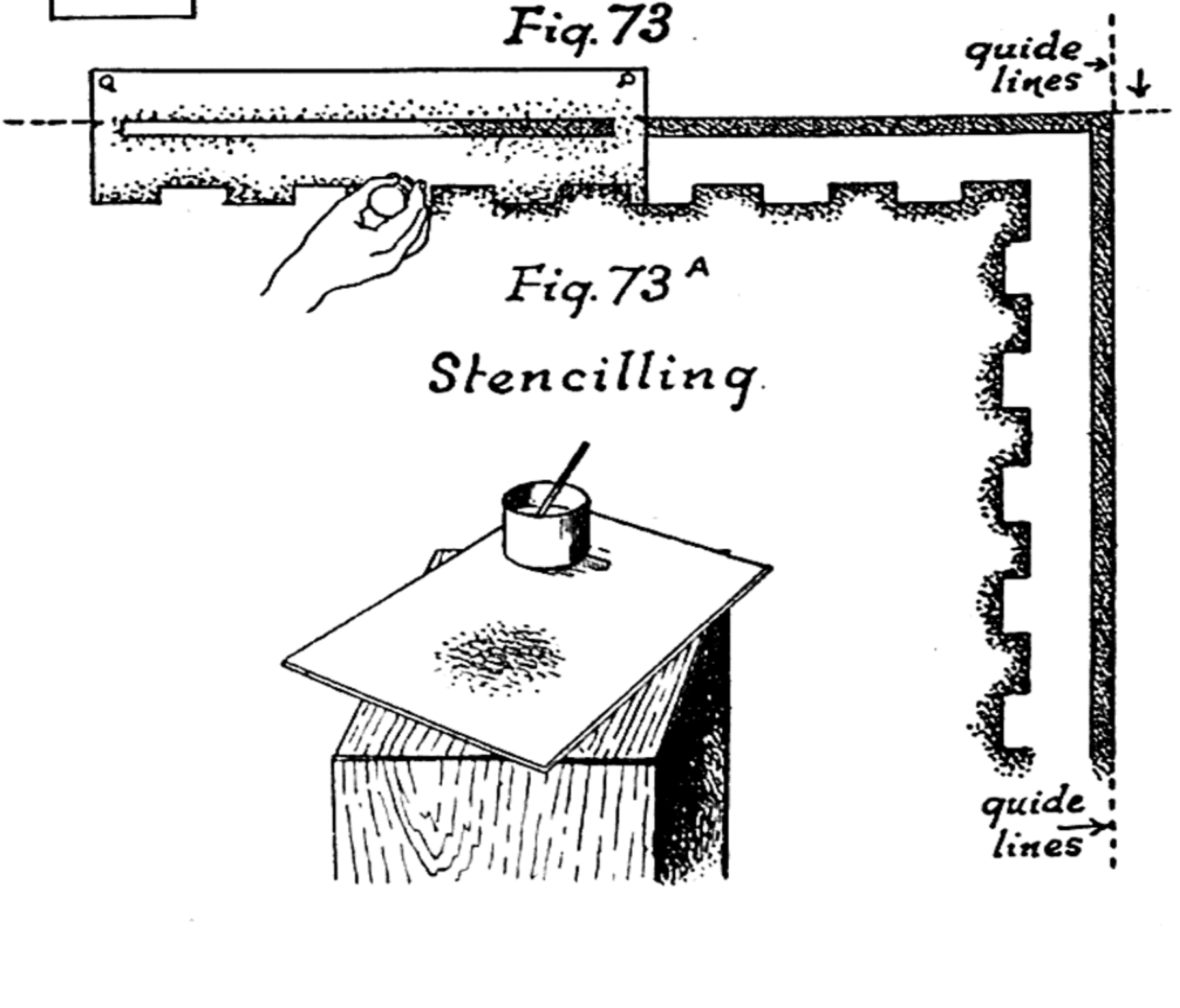


Fig. 73 A

Stencilling.

of a beginner. The necessary guide-lines are "struck" with white chalk and a length of twine, using the straight-edge, spirit level, and plumb-line to obtain true horizontal and vertical lines.

A stencil is drawn and cut from stout cartridge paper (Fig. 73), with a single or double line and, if desired, with a broken corner (*X*). The inside line can be straight, wavy, zigzag, etc., according to one's choice, but the stencil plate should not exceed 1 foot in length. An interesting and attractive variation is secured by cutting the inside edge to form a mask with a wavy or other contrasting shape (*Y*). The work can thus be executed in two colours to give two clearly defined lines and an additional shaded edge.

The paint employed may be oil-bound distemper or flat oil paint, the latter for preference. The colour is picked up from a palette board, stippled lightly on a dry part of the board (to remove surplus colour) and used throughout in a fairly dry condition. The stencil brush should be used in the same manner as a stippler —*i.e.*, with a light dabbing motion just sufficient to apply the paint without forcing it beneath the edges of the stencil (Fig. 73A). If this happens, or if the brush is too wet, a ragged edge results, and the stencil will need to be wiped clean.

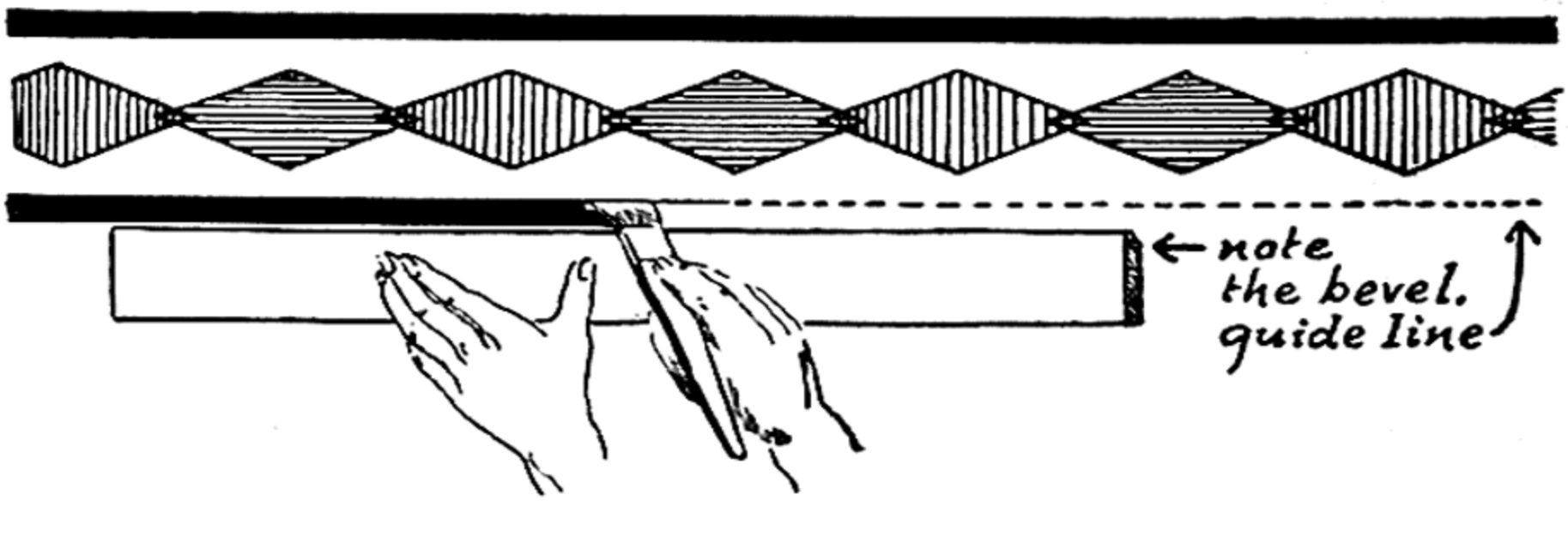
Painted lines are applied with a lining fitch or a well-worn flat fitch used in conjunction with a bevelled straight-edge (Fig. 74). The paint should be thinned to an easy brushing consistency and the brush used with little pressure. Use long strokes, covering the same ground several times until the line is smooth and of even thickness. Angles and broken corners are afterwards touched-up with a sable writing pencil (lettering brush).

The essentials of a good job are: Thin colour; a brush of suitable shape—*i.e.*, slightly bevelled at the tip,

and free from straggling bristles; and at least one hour spent in concentrated practice on a painted board. Wipe the straight-edge clean after each section is painted, and avoid drips from the brush. A palette board is sometimes helpful in shaping the brush and removing surplus paint.

Stencilled Decoration

It would appear that the decorative possibilities of stencilling have not yet been fully realised, at least in



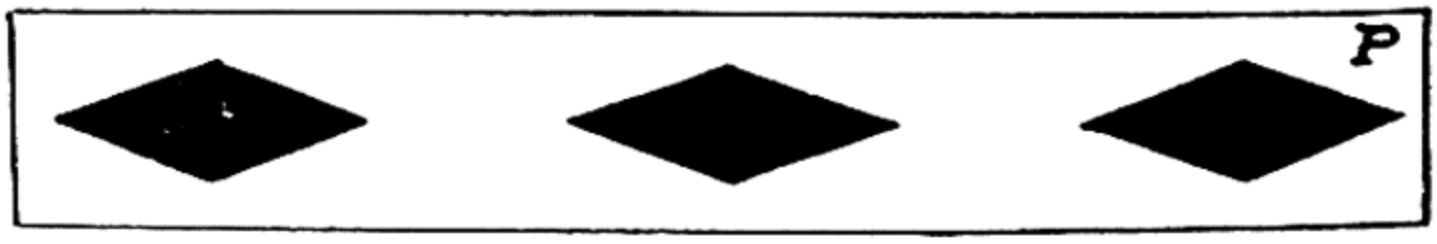


Fig. 74

Lining with fitch and straight edge. The stencilled border is executed in two operations by means of the plate (P).

relation to house decoration. This is probably due to the wide range of ready-decorated hangings in paper and other materials, and, to a lesser extent, to shortcomings in the design of stencils and lack of imagination in their use. Perhaps we have concentrated too much on the elaboration of stencils and neglected the direct simplicity of mask-produced pattern.

The term "stencilling" is too often associated with

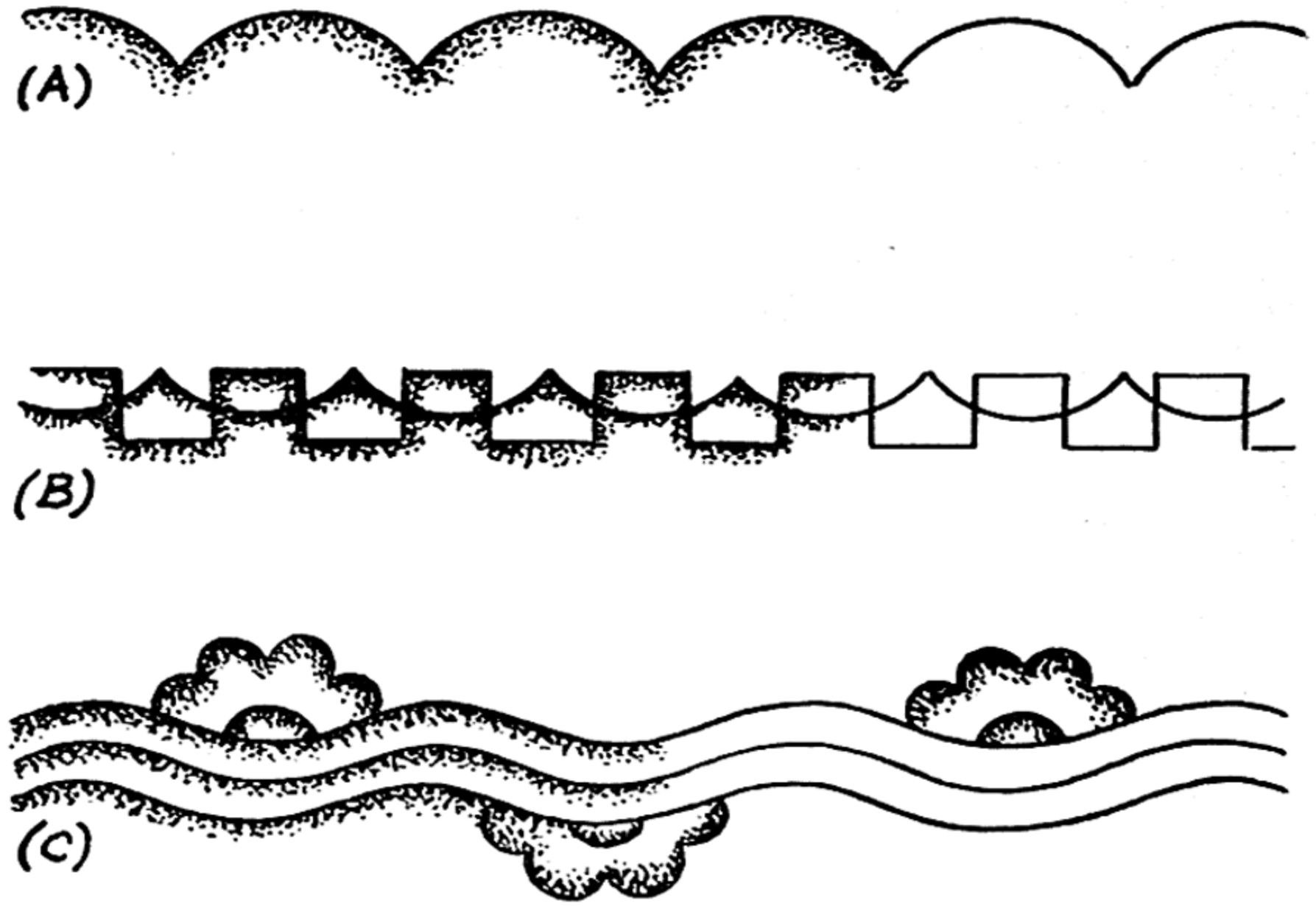
the two-dimensional patterns in vogue some forty years ago, yet there is plenty of modern work executed with spray, mask, stencil, and outline, which, because of its three-dimensional appearance, is seldom recognised as stencil technique. This later development marks a new phase in decoration and there is every reason to believe that its popularity will increase.

This type of decoration is essentially decorative and not realistic. Pictorial representation is reduced to its simplest form, thus permitting a wider use of harmonising colours. In other words, both form and colour may be conventionalised to the limit, to produce a scheme which really appears to belong to the wall rather than to a framed canvas or isolated panel. There is a transparency about sprayed decoration which, by permitting the wall colour to show through, simplifies the production of a restful and harmonious scheme possessing just the right amount of novelty to stimulate interest throughout its period of use.

Similar results can be obtained—on a smaller scale—by stencilling and outlining, but the beginner is advised to concern himself with borders, corner-pieces, and simple patterns, before launching out on more ambitious schemes of mural decoration demanding a higher standard of draughtsmanship.

We would suggest experimental work with masks, to produce the patterns shown in Fig. 75A, followed by a combination of two patterns (*b*), then by the use of mask and stencil (*c*), to form a continuous border pattern suitable for frieze height. Apply these ideas in conjunction with broken corners (*d*) to the formation of panels, always commencing at the centre and finishing at the corner of each side to ensure uniformity at the angles.

Corner decoration can be built up on the lines indicated in Fig. 76, by means of a combined stencil and



Simple effects obtained with stencils and masks

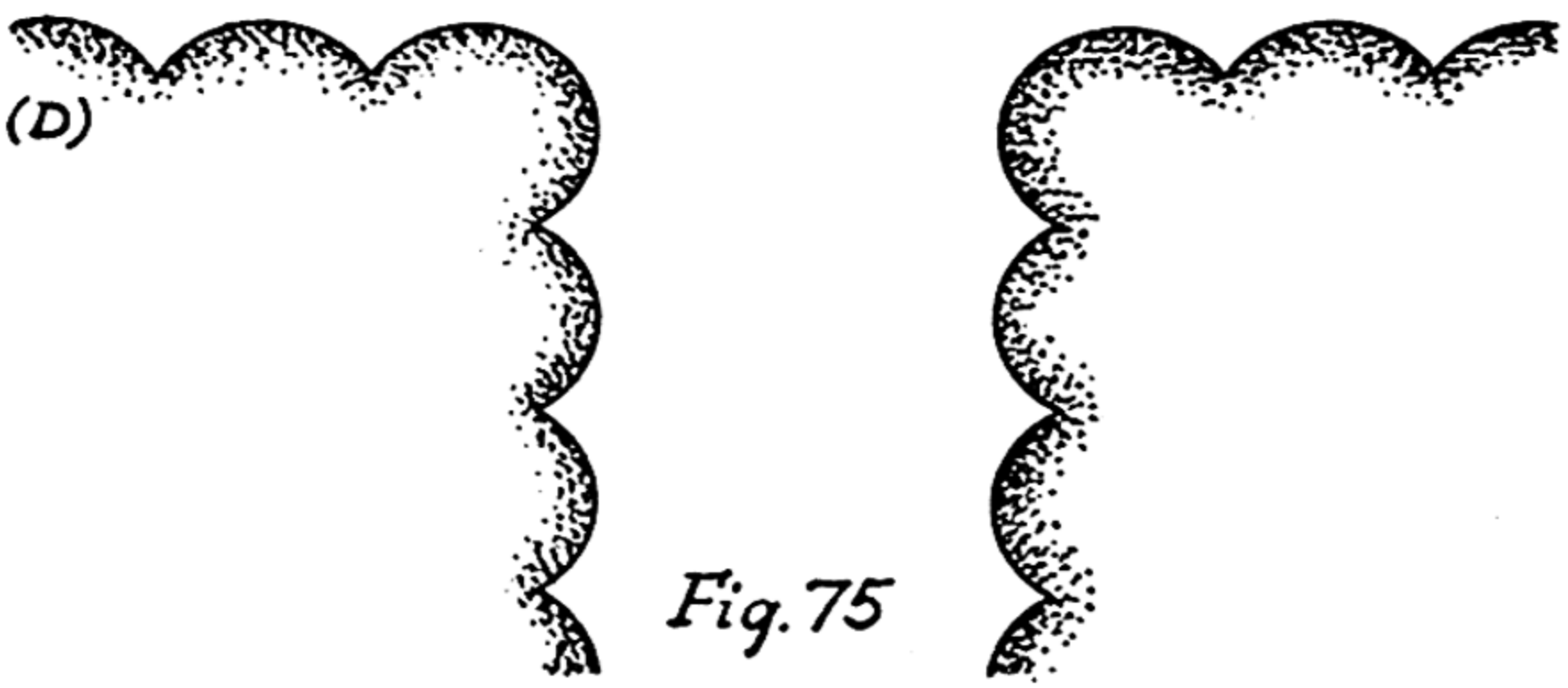


Fig. 75

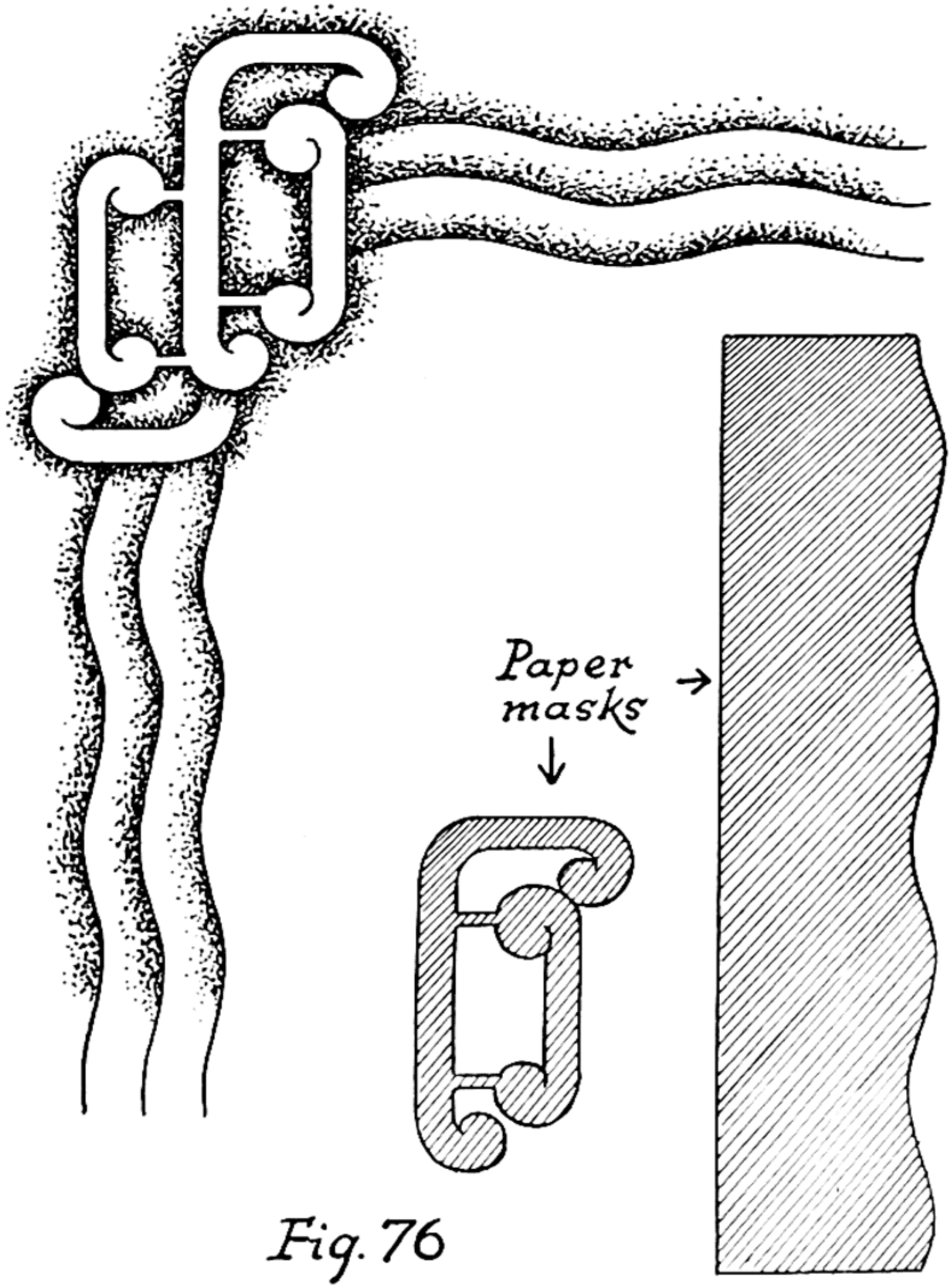


Fig. 76

Decorative corner executed by means of masks and stencilling.

mask. Additional interest is secured by the use of several colours, and the composition can be outlined to pull the elements together and add further detail.

Centre-pieces for the decoration of panels should conform to the general shape—*i.e.*, may be vertical or horizontal, according to the type of panel employed. The design must be neat, compact, balanced, and free from details, which spread out and appear isolated from the main shape. Strike a happy balance of vertical, horizontal, straight, and curved lines, but limit oblique lines to subsidiary parts of the composition. Fig. 77 illustrates an unsymmetric but balanced arrangement of built-up stencilling completed by outlining with a sable writing pencil.

The idea might well be extended to include various types of border designs. In this type of work the design is sketched upon cartridge paper, taking care that both ends display the same unit of pattern. This simplifies repetition in a right to left direction, or vice versa, when in use. The design can be arranged as a positive, negative, or multi-plate stencil. The first-named involves the cutting out of flowers, leaves, etc., to form a pattern completed in one stencilling operation (Fig. 78A). In negative stencils the background is cut out to leave the pattern silhouetted against a contrasting colour (Fig. 78B). This type can be employed as a finished decoration, or as a basic pattern for outlining (Fig. 78C).

Several plates may be used in the production of a single design with the object of eliminating "ties" (parts which hold the pattern together); securing the effect of a painted outline; expressing light and shade, or to obtain effects usually gained by printing. Some good examples of this class employ a combination of positive and negative stencils. A simple application of this idea is illustrated in Fig. 79.

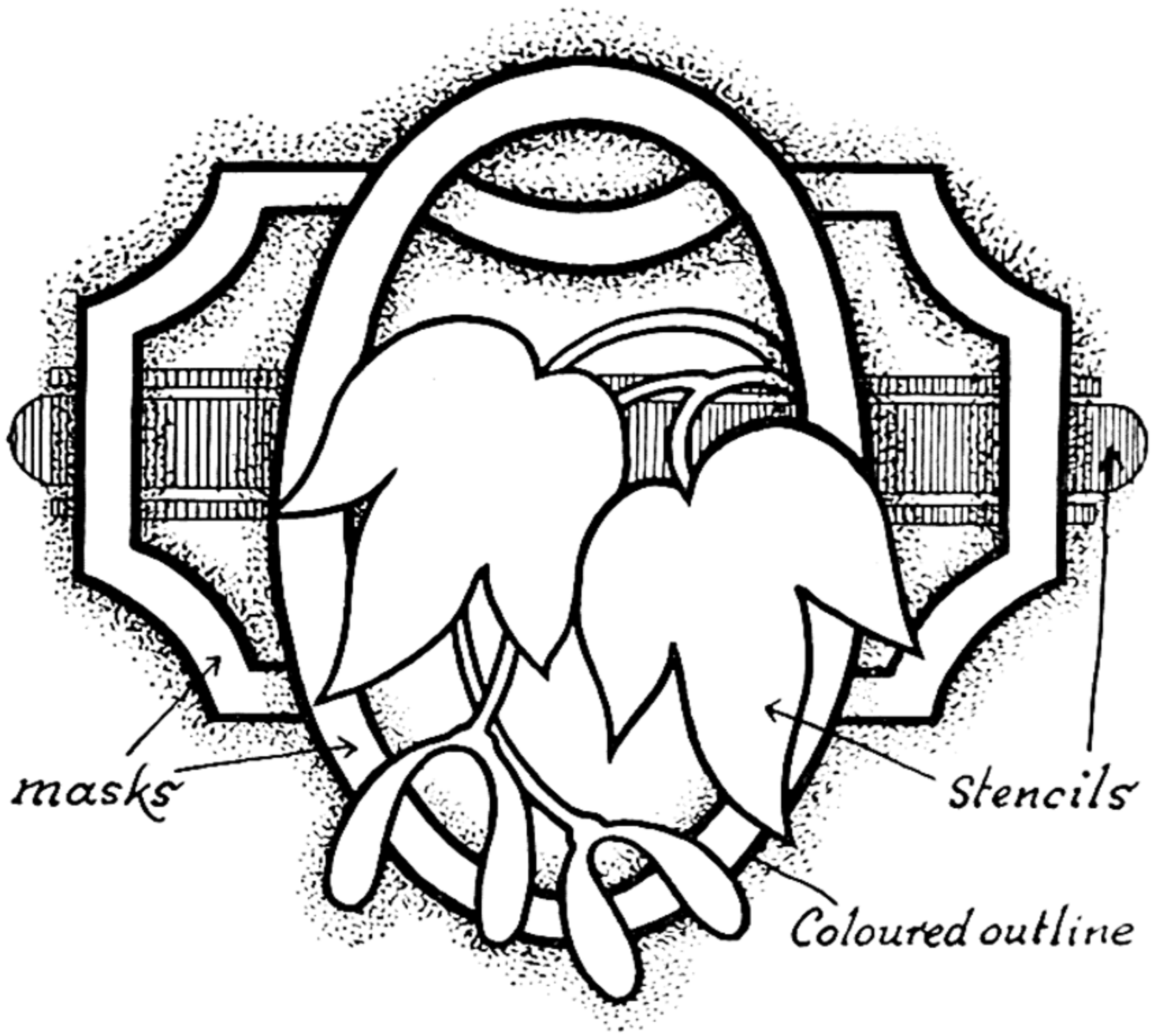
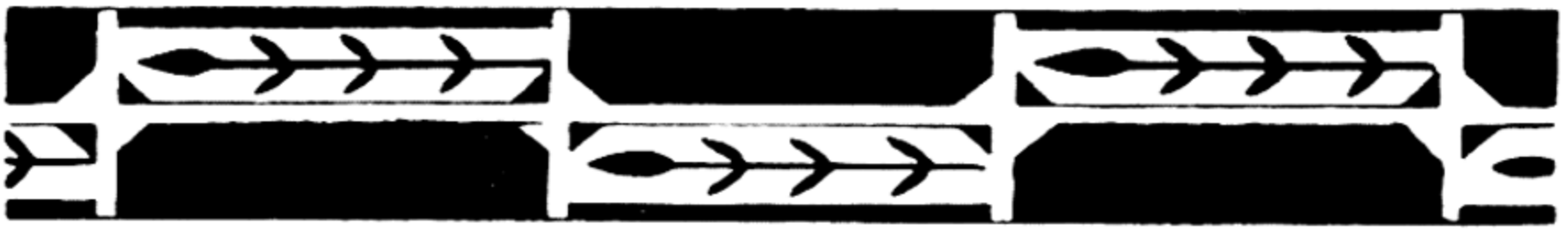


Fig. 77

Stencilled decoration for a wall panel executed by means of stencils, masks and outline.



(A)



(B)



(C)

Fig. 78

Various types of stencilling.

(A) *Positive stencil*

(B) *Negative stencil*

(C) *Negative stencil with outline*

Simple masks and stencils can be cut with the tip of a sharp knife and without any preparation of the paper, but the inclusion of "ties" will obviously demand better materials and working conditions. "Whatman" paper is stronger and more easily cut than cartridge paper, but whatever the type employed it can be improved by treatment with linseed oil, a little turpentine, and terebine. When dry, the paper is placed upon a sheet of plate glass, where it cuts easily and smoothly. Repair any broken ties with gummed paper of stout quality.

Painted Walls

Flat oil paint is equally suitable for walls as for ceilings. It is really washable, is truly hygienic, hard wearing, and offers wide possibilities for decorative treatment. For bathrooms, kitchens, etc., it provides a satisfactory ground for gloss varnish or enamel paint.

Preliminary preparation will, in the majority of cases, conform to specifications already given (see p. 161) for the painting of ceilings. To these we add the following:

(1) Portland Cement. Allow one year for drying out, then coat with a proprietary "sealing solution" or "cement primer" before proceeding to apply the coatings 2, 3, and 4, on page 161. In the meantime, oil-bound distemper could be employed as a temporary decoration upon new cement surfaces. (See p. 94).

(2) Keene's Cement should be primed with a thin coat of white-lead paint containing a large proportion of turpentine. This is applied within a few hours of the completion of plastering; a job which is usually outside the scope of the amateur. Failing this preliminary coating, an old surface should be glass-papered and then treated with the full number of coats specified above (p. 161).

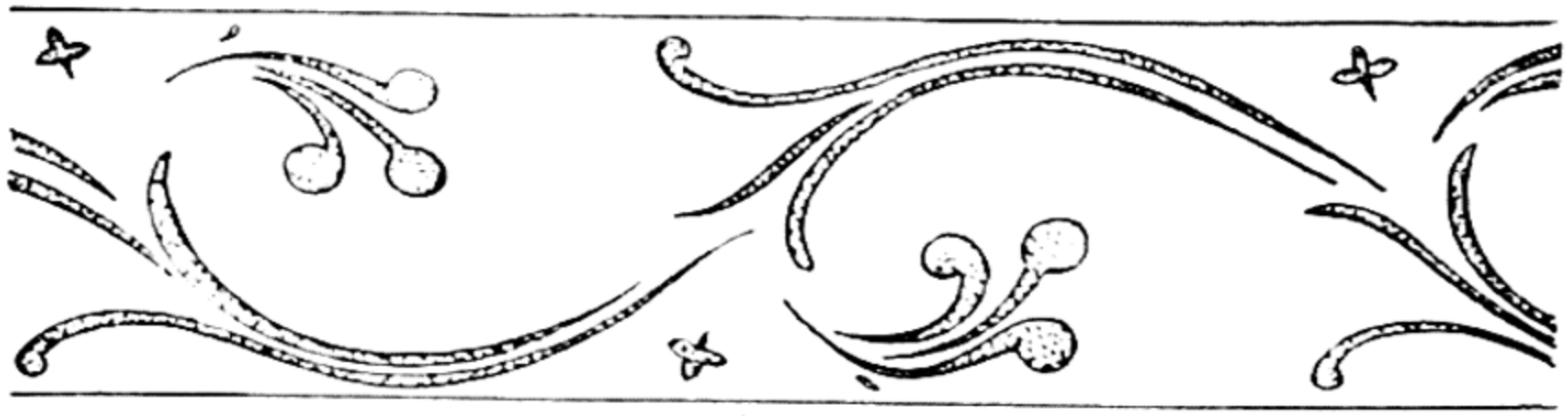
(3) Oil-bound Distemper (chipping badly). Wash



(A)



(B)



(C)

Fig. 79

The illustration (A) shows a stencilled border executed by means of (B) a negative, and (C) a positive stencil plate. The background colour gives the impression of an outline.

and scrape to remove loose material; prime with zinc-base flat-paint; fill hollow places with alabastine; glass-paper and touch-up with paint; apply coatings 2, 3, and 4 as specified for Portland cement.

(4) On no account must glue-size be employed for the checking of surface porosity. This substance is liable to become perished with age and may peel away from the surface coated.

(5) Complete the ceiling, cornice, and frieze; undercoat walls and woodwork, but finish the walls before applying a final undercoat to woodwork.

Painting follows the order and technique suggested for the application of oil-bound distemper (see p. 206); note also the instructions relating to the painting of ceilings (p. 161).

Shading

The shading and blending of two colours to produce perfect graduation of tone forms an attractive decoration in itself. This is quite possible with oil paint of the semi-gloss type, but exceedingly difficult with a quick-drying material, such as washable distemper. To decorate a room in cream and rose we should proceed as follows:

Prepare sufficient cream colour for the whole of the wall area, and one-quarter of this amount of rose colour (white and crimson lake). Take two clean paint kettles and into each weigh out one-tenth of the cream paint. Tint one by the addition of one part rose to three parts of cream, and the other with an equal amount of rose, thus producing four tints altogether; this is the absolute minimum for a shading job. It will be found that greater contrasts require five or even six tints, with a separate brush for each, but it does simplify the work and gives a better finish.

A four-colour job should be executed with four stipplers

or soft hand-brushes, but on no account must there be less than three. The walls are painted one at a time, commencing at the top and working downwards in a series of horizontal strips until three-quarters of the area is covered with the palest tint. Meanwhile, an assistant must follow up with the stippler. There now remains the lower quarter to be painted in three tints and suitably blended.

Paint the upper third of this area in pale rose, then, with the brush in a fairly dry condition, blend into the cream, using light horizontal strokes on the rose and cream alternately. This is continued until the two colours are softly blended, after which the area is treated with a clean stippler. Complete by treating the middle and lower strips in the appropriate colours, blending and stippling each in turn, and finally wiping the edges of adjoining woodwork.

Each wall is painted in a non-stop manner so as to join up to the preceding strip before the paint sets. By using semi-gloss paint, and 2½- or 3-inch brushes, it should not be difficult to produce a satisfactory job. If the paint sets too rapidly, add a small amount of refined linseed oil.

The same treatment can be applied to ceilings, in which case the area is set out in white chalk to give a circle at the centre and three adjoining bands for the separate tones. Only one stippler is required, this being wiped clean with rag after the stippling of each band of colour.

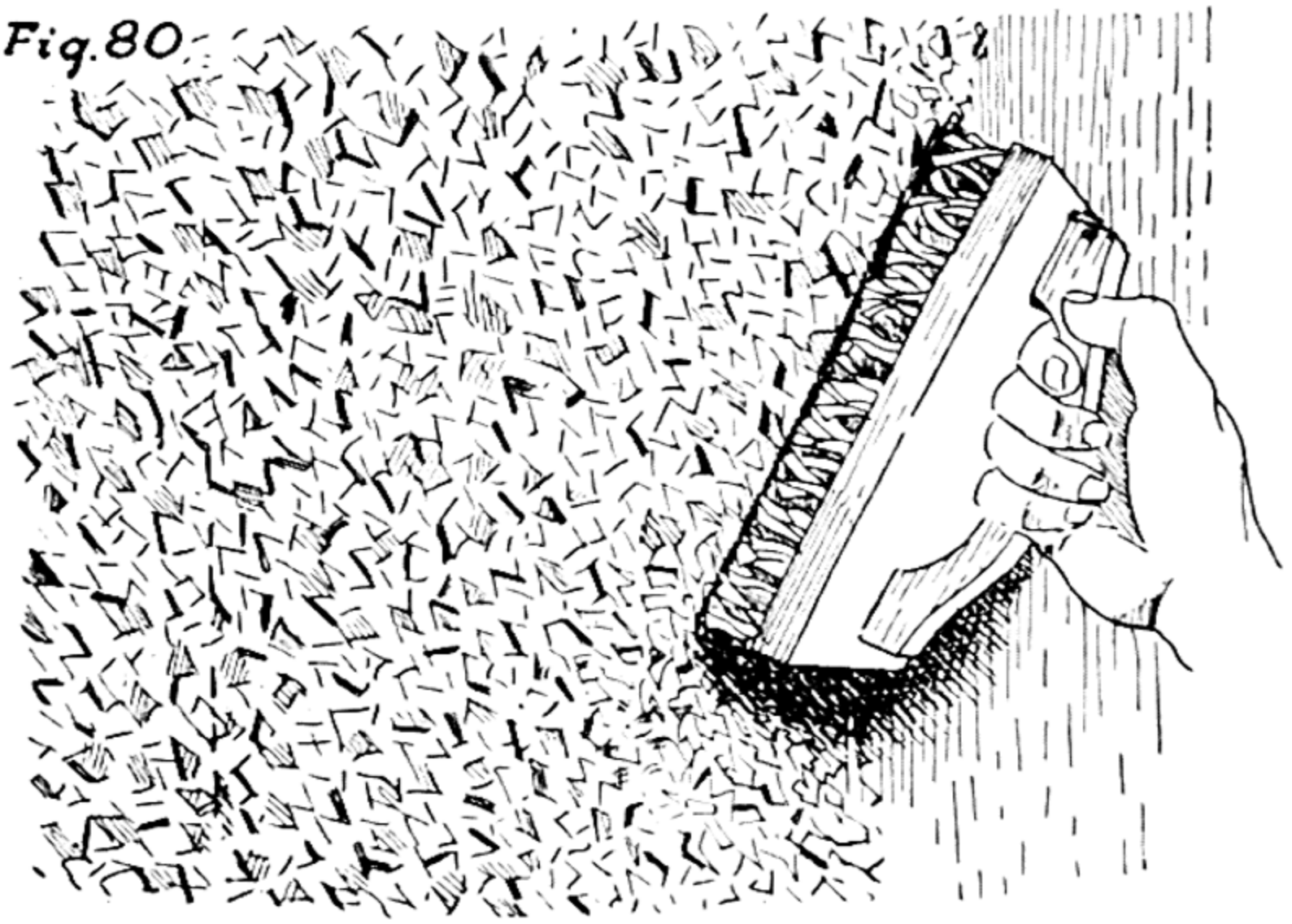
Glazing and Scumbling

These terms describe the process of coating a painted surface with semi-transparent colour, to give an impression of depth and richness, to harmonise existing colours, or to provide a base for combing, stippling, rag-rolling, marbling, and other forms of paint manipulation.

"Glazing" is carried out in one colour—frequently in the form of a mere wash, whereas "scumbling" is executed in various tones or colours and in certain cases may be semi-opaque. Either may be carried out in distemper or oil colour, as required, but the finish should be soft and quite free from brush-marks (see p. 224).

Because of the large areas concerned, walls are treated

Fig. 80



in thin colour, mixed with equal parts of oil and turpentine and a little terebine driers. Generally, a pale undercoat is employed beneath a glaze of stronger colour —*e.g.* pale blue, green, yellow, pink, etc.—upon an off-white ground or a groundwork of graduated tints. A wall can be tackled single-handed, but the work is much easier if assistance can be obtained.

The wet glaze can be stippled to produce a fine even pattern, treated with medium or coarse rubber stipplers (Fig. 80), rag-rolled upon a fine stipple (Fig. 81), rag-

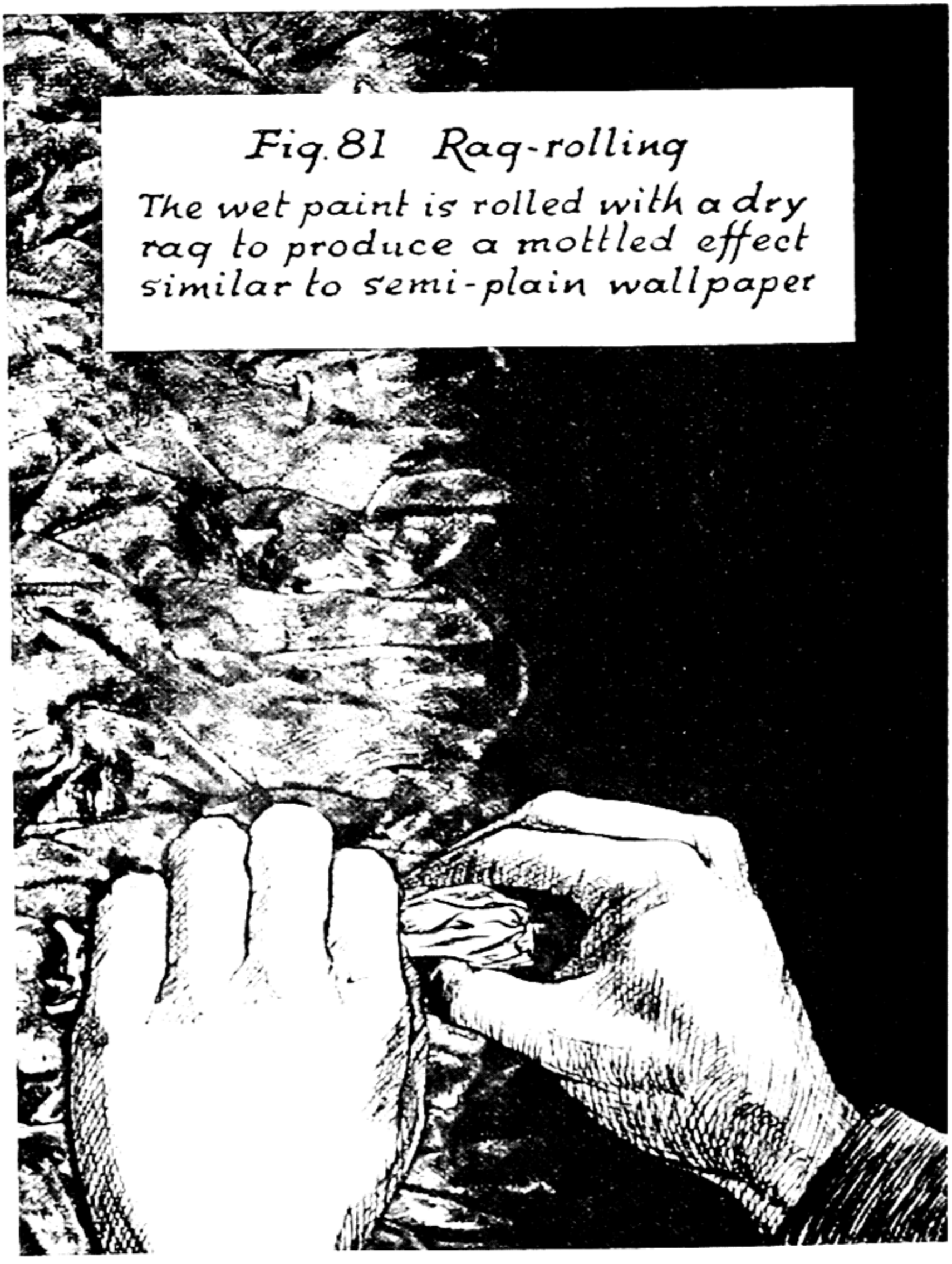


Fig. 81 Rag-rolling

The wet paint is rolled with a dry rag to produce a mottled effect similar to semi-plain wallpaper

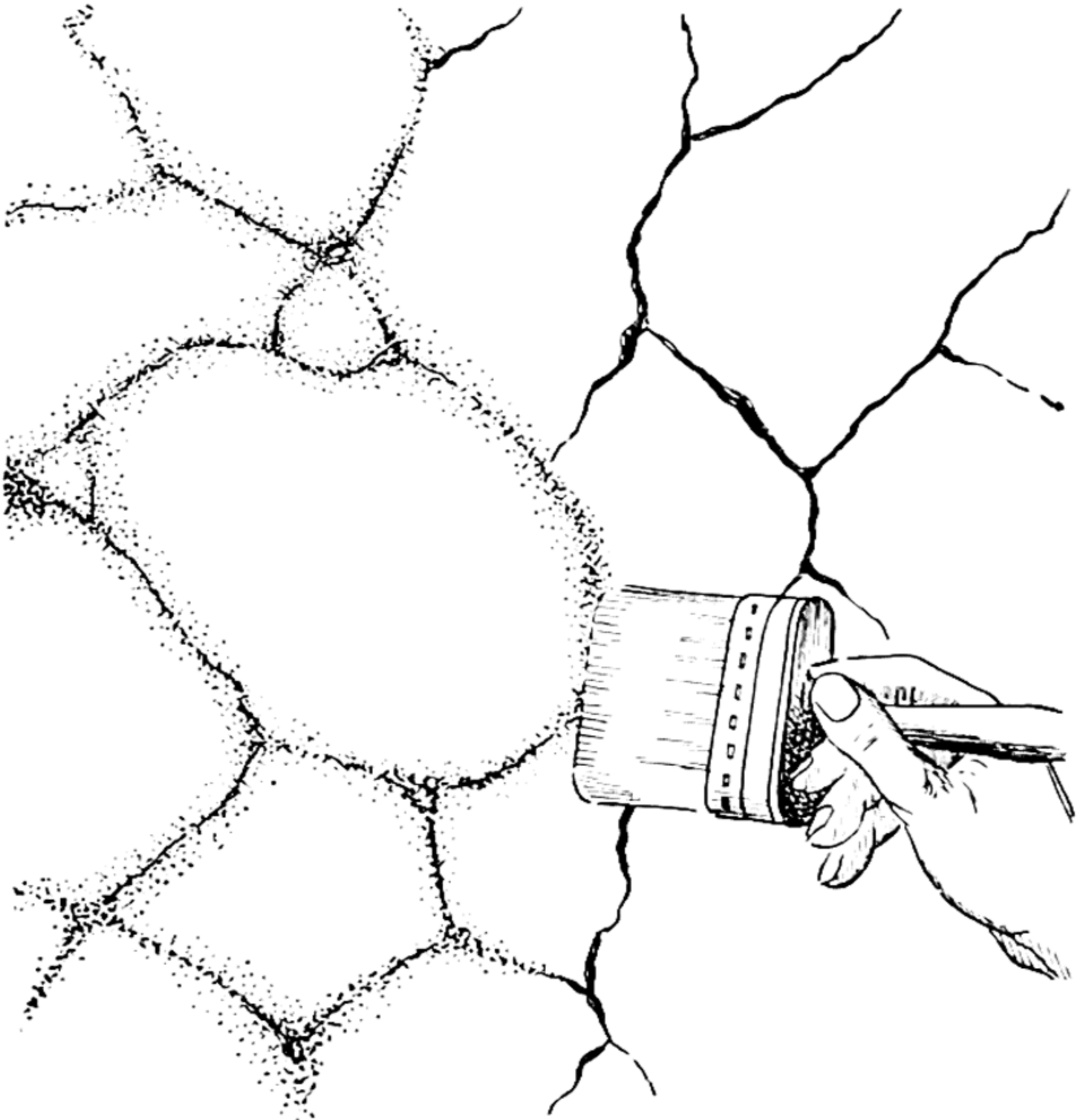


Fig. 82

Marbling.

The pattern is executed in coloured crayon (or paint) upon a freshly painted surface, and softened or blended with a dry brush.

stippled, patterned by swirling with crumbled paper, etc. Multi-coloured variations are obtainable by patterning a scumbled surface. Here, the various tints are applied (upon a wet glaze) in irregular patches and softened or blended by stippling, or by a series of light criss-cross strokes with the tip of a dry brush. The hog's-hair softener used by grainers is ideal for the job.

Scumbling is also employed for the decoration of plastic paint. The work is prepared in semi-gloss oil paint, scumbled in thin washes of harmonious tints, blended by stippling and then wiped with a flat pad of clean rag to remove colour from the tips of the relief. As an alternative to wiping, the tips may be touched with pale gold or other metallic powder applied in the lightest possible manner with a rabbit's foot.

Marbled effects (Fig. 82) are easily secured by the manipulation of a freshly scumbled surface. After scumbling, and without any preliminary softening, the veins are sketched with crayon, or painted with a writing pencil, in darker colour. A feather is then dipped in turpentine and dragged across the work in all directions; stipple with a crumpled rag, and soften with a soft, dry brush. Lead-pencil lines may be employed to suggest joints between adjacent slabs of marble. (*Note*.—These methods may be executed upon semi-gloss or egg-shell gloss paintwork providing that surface porosity has been overcome.)

Varnishing enhances the appearance and gives adequate protection to glazed or scumbled work. Use a hard copal varnish of the palest type for kitchens, bathrooms, and other situations where frequent sponging down is necessary. In living-rooms an egg-shell gloss encaustic varnish is definitely preferable; it is pale in colour, easily applied, economical, quick drying, remarkably smooth, and almost invisible.

CHAPTER VI

WOODWORK AND FLOORS

Painting ; staining ; graining, and french polishing.— Floors : staining, varnishing, polishing, and colouring of wood, cement, and composition floors.

THE preparation and painting of internal woodwork must follow the general procedure laid down for external work; the only variation concerns slight adjustments in the proportions of materials employed. Apart from window-frames, the sheltered position of the work enables harder coatings to be used, which means the inclusion of less oil, particularly in undercoats.

Defects are not nearly so common as in exterior paintwork and will usually take the form of cracking rather than blistering or flaking. Cracking may be due to an excess of oil in the undercoats, the application of thick coatings, failure to rub down a previously applied gloss finish, or to allow adequate time for the drying of undercoats. If localised to edges adjoining wallpaper, the trouble is probably caused by neglecting to sponge off paste during paper-hanging.

The remedy will depend upon the depth of the cracking; if in the nature of shallow, surface cracks, the work can be levelled by rubbing down with "Strippabloc" and water, a process which would obviously waste time and energy if applied to deeply fissured surfaces. The latter condition demands the complete removal of accumulated coatings (see p. 80).

All surfaces must be washed with a solution of sugar soap or washing soda and rubbed down to a smooth surface. Waterproof glass-paper (No. 1½ grade) is

suitable for mouldings, flat-paint, and semi-gloss paint, but "Strippabloc" is more effective for high-gloss finishes. Commence at the top and work downwards to avoid splashing other prepared surfaces. Use an old brush for the removal of dust from tops of picture-rails, window architraves, door casings, and doors, but on no account must water be allowed to splash or run down the outside surfaces of doors and window-frames. This point must be noted when washing the rebates of door casings and window-frames—situations particularly liable to accumulate dirt and dust.

Each item should be rinsed with clean water immediately after rubbing down; dry off with a sponge, and keep the floor as dry as possible throughout. Skirtings are too often neglected, particularly at the angles, where dust is most liable to collect. These parts, and all angles between skirtings, door casings, and floors, should receive special attention, and be scraped, if necessary, before rubbing down. Lastly, remove old paint spots from windows and leave the panes clean.

Painting must not be commenced until all surfaces are thoroughly dry, and any necessary plastering between walls and woodwork is completed and glass-papered. Proceed with the painting of all work involving the step-ladder, then with cupboards, doors, and skirtings. If the work is to be finished in one or two coats, it will be necessary to stop all cracks, etc., and to touch up plaster repairs in adjoining angles before painting. Furthermore, the paint must be very similar in colour to the underlying surface, especially in the case of a one-coat job in gloss paint.

An existing colour can be changed from light to dark in two coats, but to reverse this operation will require at least one extra coat. Panelled doors, cupboards, and other moulded surfaces may be treated in two colours, or

in different tones of one colour, in which event the panels would be pale and the moulds and stiles dark. To extend this idea of two-colour work, the whole door can be dark, and the casing, skirting, and picture-rail in a pale colour, or vice versa. Another variation is secured by contrasting flat and gloss paints, the former for door panels, the latter for stiles.

For pale tints, a good-quality zinc-base paint will obscure the old paintwork more efficiently than lead paint, but whatever the type chosen, the undercoats should be of a dull, semi-gloss character such as can be obtained by thinning a semi-prepared paint with turpentine only, or, alternatively, by mixing the stiff pigments with three parts of turpentine to two parts of refined linseed oil. This dries with a firm surface and is suitable for general undercoating or as a ground for graining, scumbling, etc. The final undercoat before varnish or other gloss finish should contain only half this amount of oil.

The painting of woodwork is much easier when adjacent walls are to be papered, for in such cases about $\frac{1}{4}$ inch of wall must be painted with the woodwork. In other cases, particularly where distempered walls are concerned, the paint must be applied carefully to produce a perfectly straight line along the edges of adjoining woodwork.

Another awkward job is the painting of ballusters, treads (steps), and risers, in staircase work. Ballusters should be coated first, then the left-hand side, treads, and risers—from top to bottom—and, finally, completing the right-hand side, taking care to walk on the dry centre portion throughout. The ability to paint to a straight-edge is soon acquired, but until that stage is reached it is advisable to make full use of some convenient mask, using thin cardboard, metal, stout paper, or other substance with a straight edge, for the protection of adjoining surfaces.

A floor, for example, can be protected whilst painting a section of skirting (Fig. 83), the bottom of a door, etc., and, incidentally, the brush is not contaminated with



Fig. 83
How to simplify a difficult operation.

dust. Masking tape, an adhesive fabric used in spray painting, might also be used to advantage. This is obtainable in various widths, can be used several times, and does not damage painted surfaces.

Staining and Graining

The essential difference lies in the fact that staining is carried out upon a surface of new or unpainted woodwork, but graining involves the application of semi-transparent pigment upon a painted background. The first requires a porous surface, the second a non-porous ground of suitable colour. Staining can be executed with dyes or pigments, whilst graining calls for pigments only. In both cases the grain can be represented and the work finished by varnishing. The one brings out the natural beauty—or defects—the other obliterates defects.

Surfaces for staining must be cleaned and smoothed by glass-papering, and nail-holes filled with plastic wood (see p. 89). Further treatment will depend upon the quality of timber employed. Hardwoods and other choice woodwork should be dusted down and stained with a proprietary stain soluble in water. This will colour, but not obscure the grain, and may be applied with brush or sponge as desired. Test the colour on a piece of spare timber, keeping the tone a little paler than the required finish. Apply a liberal coating and keep the colour even. When dry, fill up open pores with grain filler.

Chemical stains are dilute solutions of washing soda, ammonia, or even lime-water, which, although colourless in themselves, will intensify the grain contrast in mahogany, walnut, and similar woods. Any one of these solutions can be applied prior to staining.

Spirit stains are of two kinds: (*a*) those thinned with methylated spirit, and (*b*) ready-made stains containing naphthalene. The first dries too rapidly for successful application by amateurs, but the second is easily applied. Both give rich, clear colours and penetrate deeply, but do not check porosity.

Varnish stains are of two types: (*a*) spirit-varnish stains which dry too quickly to penetrate, and (*b*) oil-varnish stains which, because of their thickness, are also incapable of penetration. These have the advantage of checking porosity, thereby expediting the production of gloss, but because of lack of penetration these surfaces are liable to show every scratch, especially when used upon floors. There is also some difficulty in brushing out the spirit type to give an even colour; the material should be thinned with methylated spirit and applied in a series of thin washes rather than in one or two thick coats.

Oil stains are semi-transparent washes prepared from

semi-opaque pigments, or from proprietary scumble stains, thinned for use with equal parts oil and turpentine, and a proportion of terebine driers. Although this variety lacks the clearness of other stains, it is easily applied, preserves the timber, checks suction, and penetrates deeply. The addition of a small amount of varnish eliminates another defect—brush-marks.

Stain is applied to a door in the same order as in painting (p. 138), but without any preliminary treatment of knots. There are, however, certain instances where thin knotting should be used to ensure the following conditions: (1) Columbian pine must be treated in order that oil stain will dry; (2) doors containing timber presenting varying degrees of porosity are coated with knotting to check undue suction and produce a more even colour when stained; (3) end grain and other very absorbent or rough surfaces are also improved by the same treatment.

Nail-holes may be stopped with plastic wood before staining, or filled with tinted putty (made from whiting, gold-size, and stiff colour) when the stain is dry. Allow one day for surface hardening and then coat with equal parts gold-size and turpentine. When hard, the work is lightly rubbed down with No. oo waterproof glass-paper (used wet), sponged down, and dried off with a wash-leather. This procedure is repeated to obtain a non-porous surface suitable for gloss or flat varnishing or wax polishing.

The list of pigments on the opposite page is equally suitable for staining and graining in either oil or water-colour.

Graining Colours and Grounds

The term " graining " describes a process employed for the representation or imitation of all species of timber,

Colour required.	Pigments required.
Light oak.	Raw Umber and Raw Sienna.
Medium oak.	Burnt Umber and Raw Sienna.
Dark oak.	Burnt Umber and a little Black.
Walnut.	Burnt Umber.
Mahogany.	Mahogany Lake and Vandyke Brown.
Pitch-Pine.	Raw and Burnt Sienna.
Pine.	Burnt Sienna and Black.
Maple.	Burnt Sienna and Black.

by painting. This should not be taken too literally because much natural woodwork contains more defects than beauty of grain and it is only the best examples, or at least their characteristics, and colouring, which are worthy of consideration. A grainer does not give a slavish imitation of any timber; he studies the details of colour, pattern, translucency, light and shade, and memorises the general disposition and character of good examples of each group, and is thus able to reproduce what amounts to an original and distinctive impression of any particular type of grain.

To suggest the complicated pattern of certain woods demands considerable skill and practice, but there are many others which combine attractive colouring with simplicity of pattern, and it is upon these that the beginner should concentrate during the early stages. Note the soft contrasts and unobtrusive colouring of the majority of natural woods and compare these with some of the crude examples of graining: this, more than any written advice, should drive home the importance of starting right—*i.e.*, with restraint in the use of colour.

Select the ground colour with due care, using a dull, or bright colour, according to the effect required, but above all let it be of the right tone. We have seen instances of dark oak being grained on a light oak ground,

with results more startling than woody. The following are suggested as suitable grounds or undercoats for graining; all should be of a semi-gloss nature except when water-colour is to be employed. The latter medium works better on a dull ground of the egg-shell gloss type.

Ground Colours

Wood.	Colour.	Ingredients employed.*
Light oak.	Pale Buff.	White and Yellow Ochre.
Medium oak.	Middle Buff.	White, Ochre, and Burnt Umber.
Dark oak.	Deep Buff.	Ochre and Burnt Umber.
Walnut.	Warm Buff.	Ochre, White, and Burnt Umber.
Mahogany.	Rich Salmon.	White, Orange Chrome, and Venetian Red.
Pitch-Pine.	Deep Cream.	White Ochre and Yellow Chrome.
Pine.	Ivory.	White and Ochre.
Maple.	Ivory.	White and Ochre.

* The first pigment in each group forms the basic or predominating substance.

The ground must be hard, smooth, and entirely non-porous, otherwise the stain will dry patchy. It should match the palest detail of the wood to be grained, and, in the case of oak, should incline towards grey rather than orange. Natural wood must be stopped, rendered non-absorbent—by coating with thin knotting—and any necessary alteration of colour secured by staining in oil colour. Smooth the dry surface with No. o glass-paper.

The stain or graining colour may be (*a*) the slow-drying and easy spreading oil stain, or (*b*) a quick-drying, and not so easily managed, water stain. The first is a mixture of three parts of turpentine to two parts of oil, with terebine sufficient to ensure drying (usually $7\frac{1}{2}$ per cent. of the volume of oil) and a small amount of

pigment, which may be oil colour in 1 lb. tins, tube colours, or a proprietary scumble stain.

Water stain consists of paste pigment ground in water and thinned for use with one part stale beer (or vinegar) and two parts water. The pigment can also be obtained in powder form to be mixed on a palette with whatever thinner is selected. One pint of stain should cover at least 30 square yards when used as graining colour. Work is frequently grained in oil and glazed in water-colour, or vice versa, to gain transparency, which is finally improved by varnishing.

Pigments vary so much in strength that accurate proportions cannot be given, but $\frac{1}{4}$ lb. of burnt umber, or vandyke brown, should make enough stain for about six door sides, an area which would probably require double the amount of raw umber or raw sienna. Add pigment to the amount of thinners (oil and turpentine) required for the job, adding a little at a time and making frequent tests for correctness of colour. Thin stain is clear, transparent, and soft in effect, but too much pigment gives harsh contrast and a painty appearance. Translucent stain and a well-chosen ground are equally essential for the production of good work.

Brush-Graining

This process is employed in the representation or, to be more accurate, for the purpose of suggesting the general effect of plain wood, in the simplest possible manner. Because of its unobtrusive appearance it is often preferred to more ornate work. At other times it forms a useful background for the reception of pattern. In either case it provides excellent preliminary training in the use, application, and control of materials and brushes.

The tools required are: clean paint brushes, 1 inch and 2 inches in width; a part-worn dusting brush; a

flat piece of sheet metal, approximately 9 inches by 4 inches, and some clean rag. Oil-graining colour (already described) provides the most suitable material for beginners.

Doors and other panelled surfaces are stained in the same order as in painting, but with quite a different technique. Some grainers apply a few dabs of colour

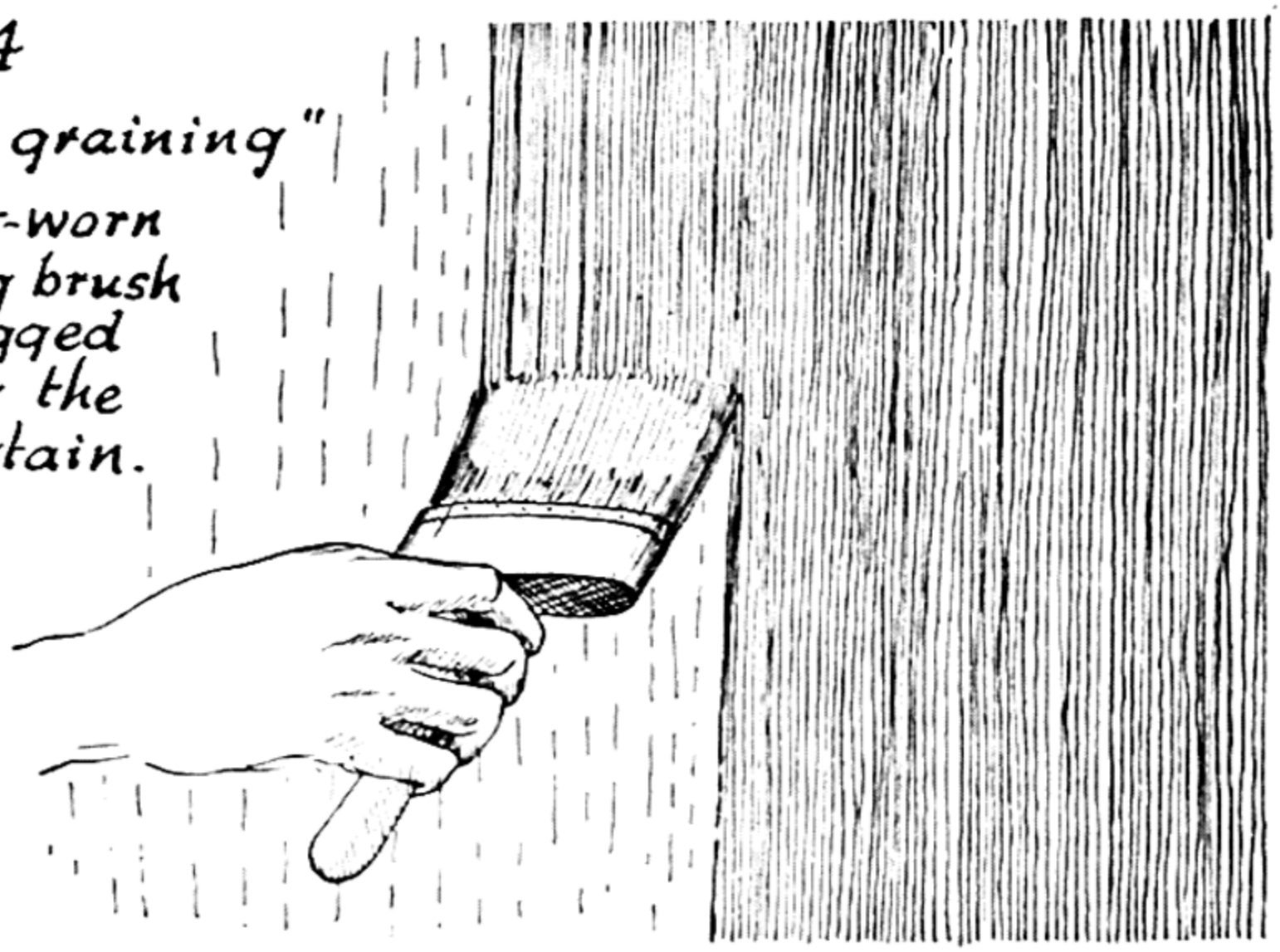


Fig. 84
"Brush graining"
A part-worn dusting brush is dragged across the wet stain.

with the small brush and spread these as far as possible with the large, dry brush until the whole panel is coated. The area is then crossed and laid off until quite even in tone. An effect of straight grain is then obtained by drawing the dusting brush along the surface, keeping the full length of the bristles in contact with the wet stain (Fig. 84) and using firm pressure throughout.

Since the grain does not continue to the extreme base of the panel, the process must be reversed, in this case

brush-graining from the base upwards, with diminishing pressure until the duster leaves the surface at a point near the centre. Some difficulty may be experienced at the tops and bottoms of panels. There is a tendency to apply too much pressure at these points, with the result that colour is dragged away, leaving the ends pale in tone.

This fault can be rectified by stippling with the tip of the dusting brush, which carries the stain from the centre to the ends in readiness for re-graining. If the correct amount of stain is applied, the graining will appear sharp, and remain so, but any excess causes loss of sharp definition within a few minutes.

Mouldings are inclined to collect surplus colour at the mitres; these should be stippled to produce an even tone before brush-graining. The muntins (short upright stiles between panels) are then completed, using the metal plate when necessary for the protection of mouldings. Follow with the cross-rails, observing and conforming to the real joints between rails and stiles. These joints form convenient breaks, enabling work to be completed in sections, but they must be kept clean and sharp throughout. On the completion of each cross-rail, some stain is unavoidably carried on to the stiles and must be wiped off to give the straight edge required; similarly, any stain spread over from mouldings should also be removed. The stiles can then be "rubbed in" (stained), using the metal plate to mask each cross-rail (Fig. 85) as work proceeds.

Although brush-graining must of necessity be somewhat severe in appearance it can be relieved by slight variations in the direction followed. The grain of cross-rails might well suggest a slanting or curved formation, but this tendency must not be overdone, and on no account must a wavy pattern be attempted. Another

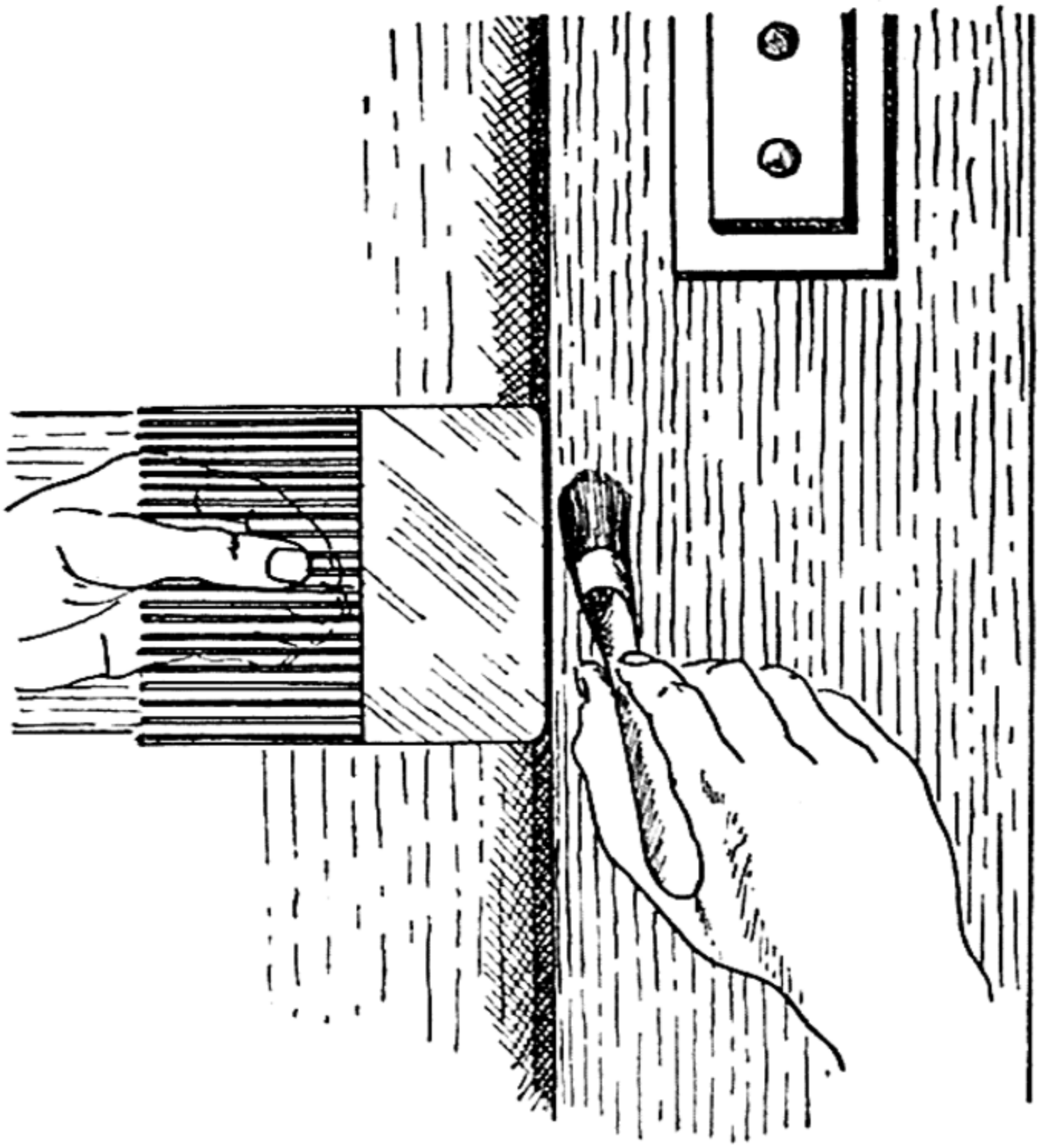


Fig. 85

Masking a cross rail to assist sharp definition between rails and door stiles.
In this instance, a 4 inch steel graining comb is employed.

variation which is sometimes applied universally throughout a room consists of stippling the newly applied stain with the side of a dusting brush. The effect is soft and quiet, and rather like coarse-grained hardwood.

Oak

An oak-tree can be cut up to yield at least six characteristic types of figuring, all of which are employed in furniture making, and some in constructional work. If the tree is beheaded during the early stages of growth, it throws out numerous shoots which interfere with normal development, forming vigorous curls and knot-like shapes. The upper portion is cut to show this formation and is known as "Pollard Oak." At the base of the tree the pattern is also of a curly nature, due, in this instance, to shoots of a different kind—the roots. Because of its more resinous character "Root of Oak" is darker and richer in tone.

The main trunk is cut as in Fig. 86A to show the heartwood, or, alternatively, as in Fig. 86B to display the medullary rays, which in oak are very large and clearly defined. The latter is variously described as quartered oak, wainscot oak, and dappled oak; the peculiar markings being termed silver grain or clashing. Heart of oak and quartered oak are the better-known types, which we propose to describe.

Both can be represented by painting the pattern upon a newly brush-grained surface, thus producing dark pattern upon a lighter background, as seen in fumed oak. An alternative method is necessary for the reproduction of ordinary oak which displays pale figuring on a darker ground. In this case the pattern is produced by wiping out certain parts of the wet stain with clean rag over a thumb-nail or veining horn.

Heart of oak (dark figure) requires very little in the

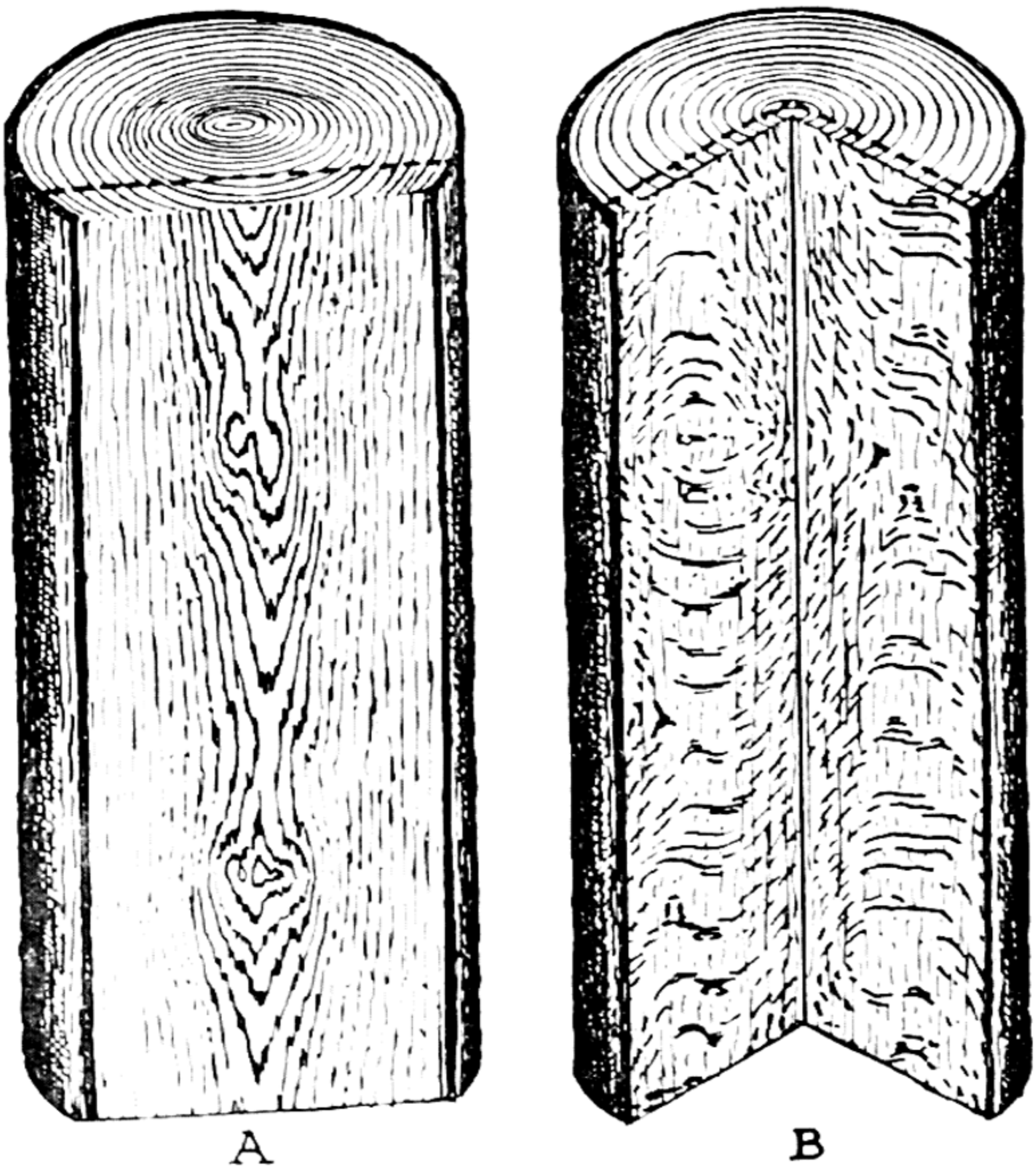


Fig. 86

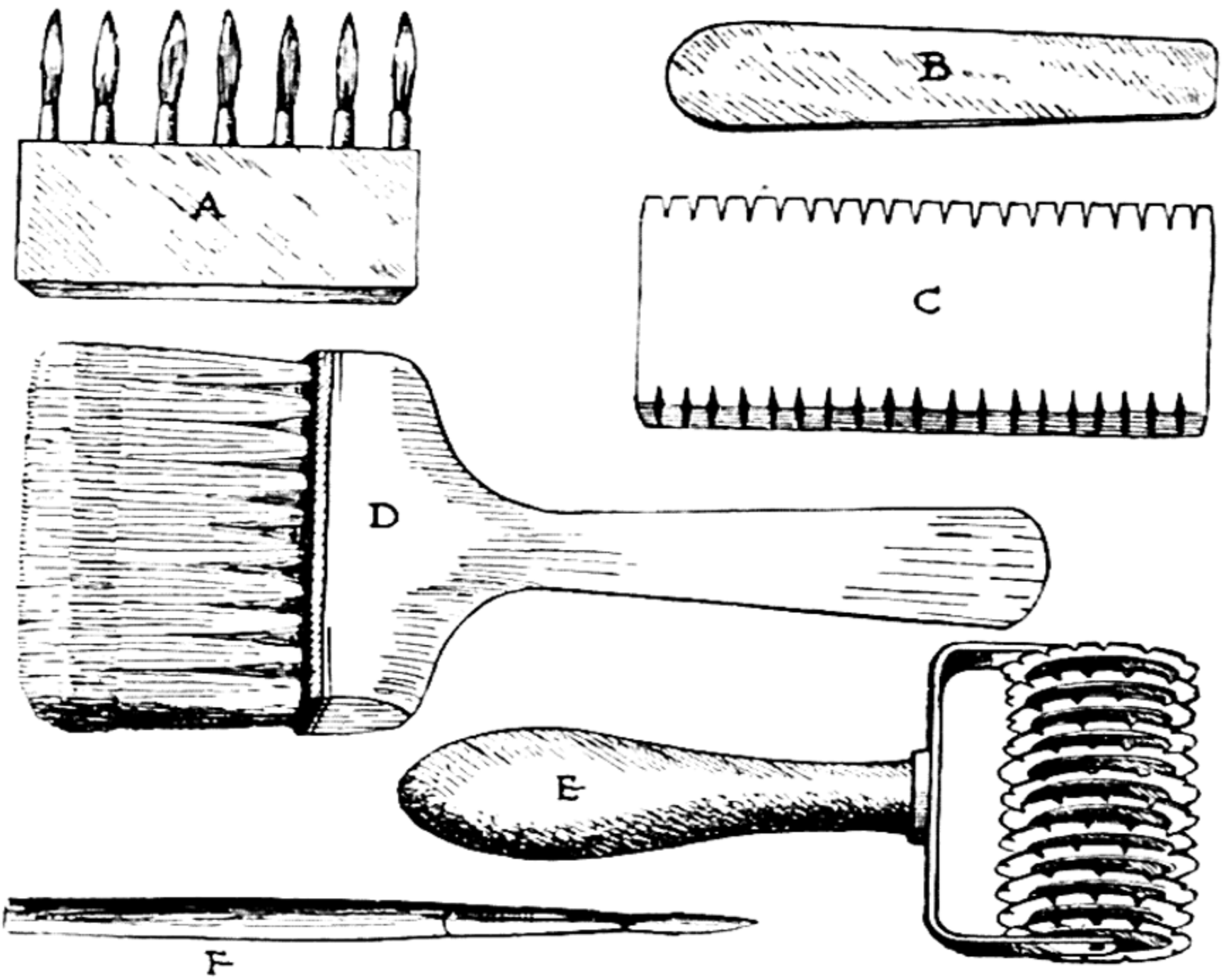
Method of cutting an oak log to produce (A) heartwood (B) quartered oak.

way of equipment; it can, with the exercise of a little patience, be executed with a large writing pencil (No. 6 or goose) and the dusting brush already employed for preliminary brush-graining. The pattern, which takes the form illustrated (Fig. 86A), is painted in a darker tone of graining colour. The latter is mixed on a palette board and reduced to a semi-stiff consistency, any further dilution being made as required by dipping the pencil into the stain and then into the paste colour.

It is most important to keep the brush as dry as possible because excessive colour is liable to run or spread and thus distort the pattern. Keep the lines running parallel, thin at the sides and thicker at the curved ends. Aim at the rugged or sketchy appearance seen in natural oak, and, as each section or panel is figured, soften by light strokes with the tip of the duster, always brushing from the centre of each ellipse, outwards. A considerable amount of time is saved by using a 3-inch pencil over-grainer (Fig. 87A) for the painting of parallel lines which form the plain parts of oak figuring.

Heartwood (light figure) calls for a reversal of the foregoing technique. In this case the wet stain is partly removed by steel and rubber combs which supplement a more difficult operation, that of wiping or marking out the characteristic and—at times—ornate figuring. It is usually necessary to stain this central portion with darker colour from the bottom of the paint kettle to give just the required contrast, but no more.

The main pattern is wiped out with clean rag held firmly over the end of a veining horn or a piece of celluloid 4 inches by $\frac{3}{4}$ inch, shaped as illustrated (Fig. 87B). Note the tapering shape of each ellipse and the ragged and comparatively broad lines forming end-curves. Change the position of the rag every few minutes, otherwise clean wiping will become impossible. Plain and



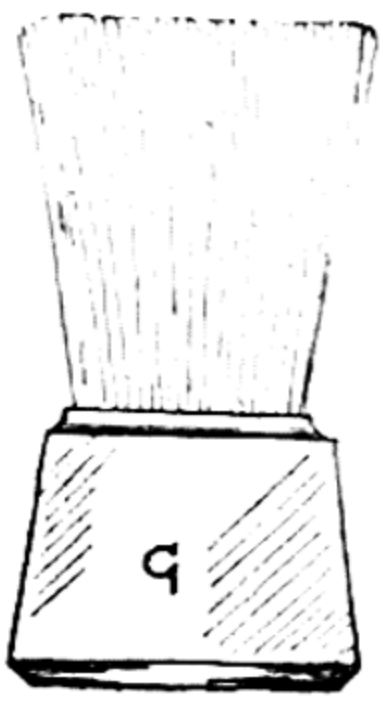


Fig. 87

A Pencil overgrainer.
B Veining horn.
C Rubber comb.
D Badger softener.
E Check roller.
F Writing pencil.
G Thin overgrainer.

fairly straight grain at either side of the centre figure is executed with a home-made comb cut from rubber or leather, and overcombed with a medium-grade steel comb: the latter is obtainable from most decorators' merchants, the 3-inch size being most useful (Figs. 85 and 87).

Combed work should be clean and in harmony with the wiped-out portion, and, as this effect can only be obtained whilst the stain is fairly wet, combing must not be delayed until the colour has become set. To the beginner who is slow in wiping out, we would suggest that rubber combing might well be executed immediately after the staining of each cross-rail—*i.e.*, before tackling the long stiles. A strip of about 5 inches in width can be left uncombed for the wiped-out pattern.

The finished heartgrain is softened with the tip of a dusting brush, but in this case the brush strokes are carried towards the centre of each elliptical shape; a technique exactly opposite to that employed in the painting of fumed oak.

Quartered Oak

Although the pattern may appear rather complicated, it is governed by definite rules and is based on the simple formation found in heartwood. The example illustrated in Fig. 86B is typical of this wood. There is a positive sense of direction and continuity of form which links the various shapes into one complete pattern. The main (horizontal) dapples vary from about $\frac{1}{4}$ to $\frac{1}{8}$ inch in thickness and are spaced irregularly, sometimes close, and at other times widely separated.

Supporting dapples at either side are much smaller in length and width, some being little more than dots. All flow in a common direction, sometimes curling, sometimes running obliquely, but always in agreement with the

larger dapples. Although the general direction is well defined there is no continuity of line in the ordinary sense: dapples do not follow end to end in single file, but sidestep to left and right whilst continuing the forward flow.

The actual graining may be executed upon a freshly brush-grained or combed background by either of the methods already mentioned. Dark figuring is more easily mastered and is painted with the large pencil, in colour used for the preliminary staining. As in heart-wood, the pencil must not be overloaded or the colour may run. The work is completed by softening lightly in a downward direction (Fig. 106).

Quartered oak is usually grained by wiping out with veining horn and clean rag. All the large dapples which decide the general formation are put in first and followed by the small supporting figure. All must be wiped out as clean as possible and with sharply defined edges. As each panel is completed, the main dapples are softened in a horizontal direction with a soft, dry fitch, and half-tones are formed in underlying spaces by stippling with several folds of cloth.

Oak graining is considerably improved by the addition of a thin glaze of vandyke brown in water. Only a thin wash—just dark enough to remove any harshness without showing brush-marks—is required, and, as this pigment is self-binding, no other fixative is used. This glaze can be applied to the dry graining with a clean 2-inch brush, or with a mottler (Fig. 88), coating the work in sections, and mottling (dabbing with the tip of the brush to form high lights) each in turn. To remove harshness the work is immediately softened in all directions with a badger-hair softener (Fig. 87D).

The prominent pores, which are a striking feature of all types of oak, can be suggested by check rolling upon the

dry glaze colour. For this purpose we employ vandyke brown diluted with vinegar and water to the consistency of thin paint. A mottler is charged with this colour, applied to the serrated discs of the check roller and then held in contact with the discs to serve as a feed brush while the grain is printed. These pores must run in the same direction as preliminary combing or brush-graining, but as they do not cross the main dapples or wiped out parts of heartwood, such details should be wiped clean with a damp wash-leather. The work dries within half an hour and is then varnished.

Walnut

This wood is usually grained in a water medium containing stale beer (or vinegar) as the fixative. The work is executed in two stages, the preliminary graining being fixed with a thin coating of varnish before proceeding to glaze, mottle, and stipple. All varieties, from heartwood to the most ornate species of burr walnut, can—according to the skill of the grainer—be completed in two operations spread over a period of two days.

Water-colour graining demands a technique quite different from oil-colour work. It dries so rapidly that panels and rails must be completed as separate units, and adjoining rails, mouldings, etc., must be sponged clean while the colour is still wet. Since the medium is too thin to keep pigment from settling, frequent stirring is necessary, otherwise the stain becomes paler as work proceeds. If the ground colour is too glossy, a water stain is difficult to apply, and in such cases the ground should be prepared by rubbing down with whiting or fuller's earth applied with a damp sponge.

Heartgrain of the American walnut type is very suitable for beginners. The stain is brushed on with a 2½-inch brush, crossed and laid off to give an even tone

and then brush-grained with a mottler to produce the general basic shape (Fig. 88). The success of this operation depends upon, (*a*) using a light and even pressure; (*b*) keeping the mottler at the same angle throughout and not twisting as if drawing the curved ends with a compass; (*c*) preserving a tapering shape from base to end-curves, and (*d*) using just the right

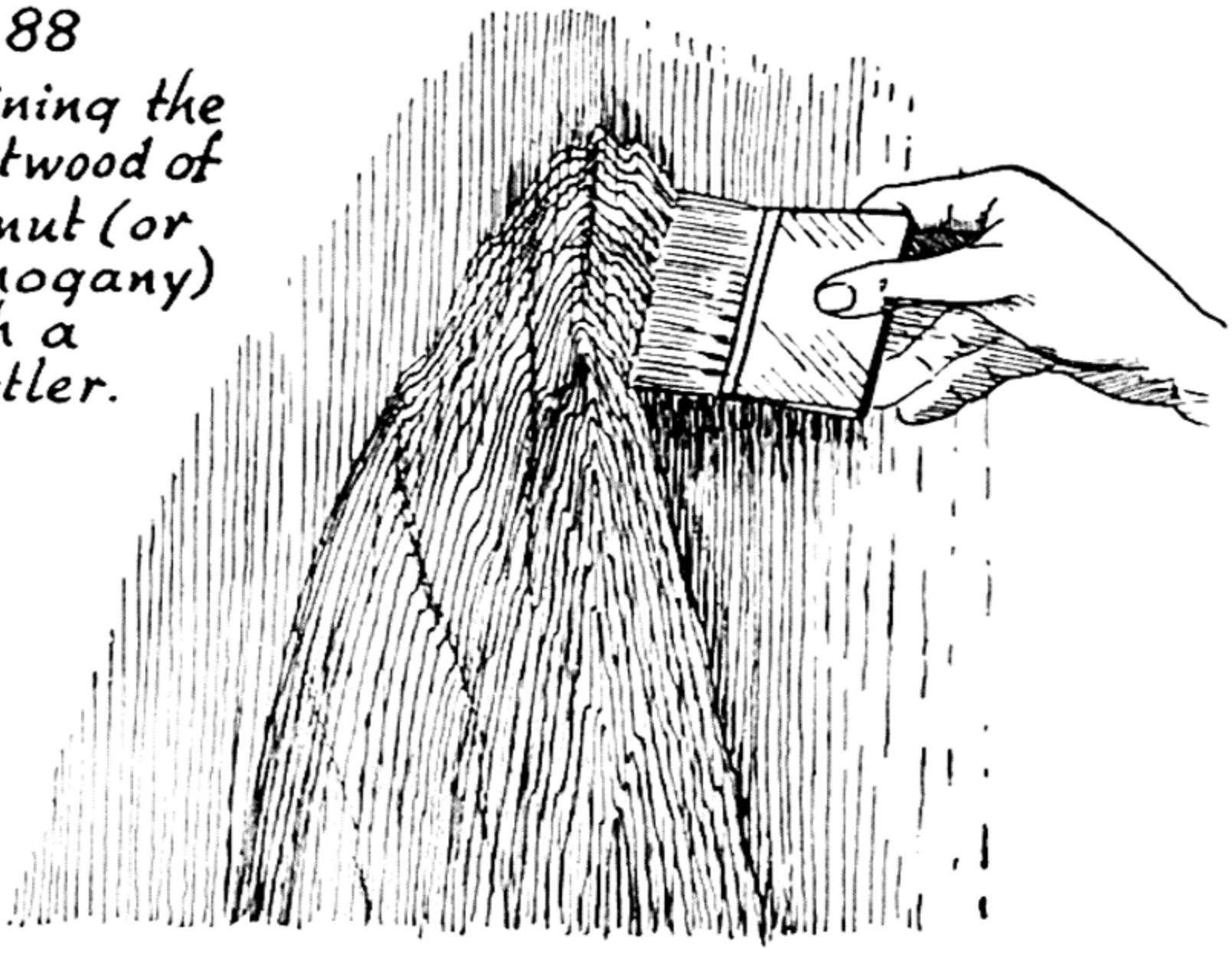


Fig. 88
Graining the heartwood of walnut (or mahogany) with a mottler.

amount of stain, neither too wet nor too dry. The latter will obviously be ascertained by practice. Finish all parts adjoining mouldings as neatly as possible and soften very slightly, using the "badger" in an upward direction.

At this stage the work is rather plain and lacking in contrast, a state which is rectified by painting upon the dry surface to darken some of the existing lines. This is carried out with a small pencil brush and the stain employed for the preliminary rubbing in, each line being

softened in an upward direction. Straight grain can be strengthened in the manner specified for fumed oak and heartwood. When dry, the work is fixed with a coating of equal parts of gold-size (or varnish) and turpentine, and allowed to harden overnight.

Continue with a very light rub down with No. oo glass-paper (used wet), wipe down with a damp sponge,

Fig. 89



and glaze with vandyke brown. Take out the high lights with a damp mottler, and stipple the whole surface with the tip of a badger softener. The work can then be finished with one good coat of gloss varnish.

Curly walnut is executed in a similar manner, the work being stained, patterned (Fig. 89) with the edge of a feather, and softened in one direction until each line gives a dark edge. The badger must be used lightly lest lines be smeared, and on no account should the work be hurried. Burr is suggested by stippling parts of the wet

surface with a coarse sponge and softening in all directions. Lastly, the edges of knots, and some of the main lines, are emphasised by coating with a mixture of vandyke brown and black in the manner described for heartwood graining.

The work is fixed with varnish and turpentine, before glazing, mottling, stippling, and varnishing, in the manner already specified. Although this treatment is generally reserved (and frequently elaborated) for doors and other important surfaces, narrow widths, such as picture-rails and skirtings, are usually completed in one operation.

Mahogany

The heartwood of this timber is grained in precisely the same manner and with the same tools as American walnut, the difference being one of scale rather than pattern. Mahogany is—apart from the question of colour—similar to but much larger in scale than walnut. It is soft in effect and lacking in sharp contrasts.

In graining a door, the panels might be figured to represent heartwood, with rails and stiles in plain and rather coarse straight grain executed with the edge of a flat fitch or mottler and softened with the badger. Softening must not be continued too long, or hard edges will appear: pores can also be suggested by careful stippling before the colour dries.

An alternative but more ornate result is often secured by graining the panels in feathered mahogany, with plain stiles, and mottled cross-rails. The latter effect is obtained by wiping out a series of straight lines, breaking and side-stepping every 8 or 9 inches, but always following a common direction. These lines are rapidly made with a small sponge constantly rinsed in clean water to ensure even colouring, then, with a small mottler, each light

patch is mottled at right angles and softened in the same direction: stipple as before.

Feathered mahogany displays an interesting and distinctive pattern which is also found in birch, satinwood, and other species. To grain this timber really well requires speed and practice. The stain is applied liberally (to delay drying) with the centre of the panel darker in tone, then, with a small, damp sponge, the pale strips are wiped out in a downward direction, giving the effect of coarse-grained heartwood, minus the curved ends. These ends are put in with a small mottler, each line springing from the top of a pale strip and arching steeply downwards to lose itself in the dark centre of the feather. The lines should be fine, clean, varied in length, and sometimes descending in twos and threes from the sponged line. Softening is carried out in all directions, but must stop at the first sign of hard edges; finally, use the badger to give a light all-over stipple.



FIG. 90

The work, which should now resemble that illustrated in Fig. 90, is over-grained with a series of faint lines in the general direction of the feather—*i.e.*, following the same elliptical curve; badger in an upward direction, and allow to dry. The graining can now be finished with one good coat of varnish or, for a better job, fixed with thin varnish and followed by glazing, mottling, and varnishing.

Pitch-Pine

This is probably the most clearly defined of all natural grain, and, in addition to its remarkable brightness, it exhibits strong lights and shades, the study of which is likely to be of value in graining generally. The work is completed in two stages, the figuring being executed in oil colour and the mottling in a water medium.



FIG. 91

In the first stage the surface is slightly stained (not brush-grained) with raw sienna, and the pattern painted with a mixture of burnt sienna and burnt umber. Plain grain which flanks either side of the main figure is applied with a pencil over-grainer. Include plenty of twists and curls, for these provide a basis for super-imposed high lights. The graining is softened with a dry brush, brushing towards the centre of each group of ring-like shapes.

When dry, the work is glazed with burnt sienna and a touch of vandyke brown. Mottling is bold, with numerous wedge-shaped high lights in the curly parts (Fig. 91), and shadows—painted with a fitch in darker colour—here and there, sometimes continuing right across the central figuring. Use the badger softener in all directions, but mainly at right angles to the grain. Complete by the application of one good coat of gloss varnish.

Pine

The increasing popularity of pale colours for interior decoration has led to a more general use of pine, maple, satinwood, and many others of equal decorative value, not only for furniture and fitments but as a finish for woodwork. Graining is always a sound economic proposition, especially if washed and varnished at intervals of a few years. Furthermore, the pale woods are completed in one graining operation.

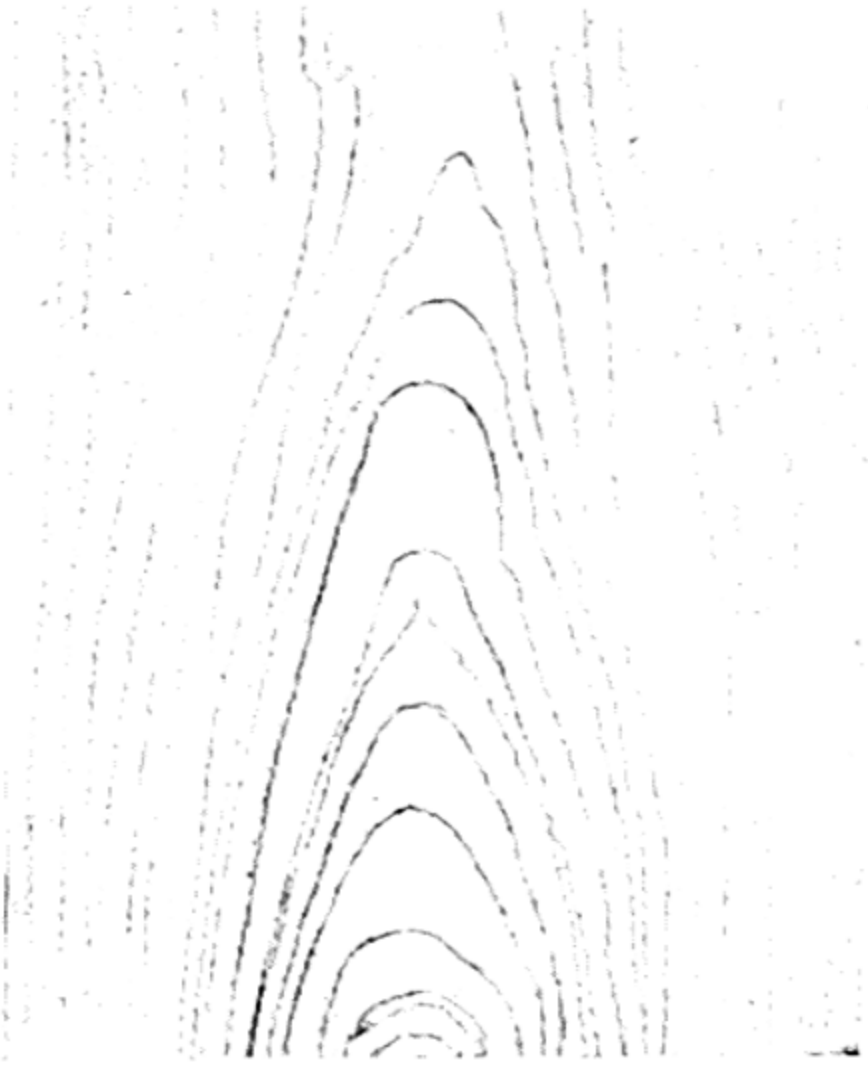


FIG. 92

Pine can be varied in colour to harmonise with surrounding details. At least, there is a choice between warm brown, neutral brown, warm grey, or neutral grey, according to the proportions of black and burnt sienna employed. It is usual to apply a fairly grey wash of almost colourless water-glaze, this being softened to remove brush-marks and, when dry, to paint the grain with a slightly warmer tone of the same colour.

The preliminary wash can be applied with a sponge, or brush, as convenient, but the grain is painted on with a pencil, each line being softened with the badger, always in an upward direction until a dark front edge is obtained. Because of the elongated spacing, a door panel can be figured in a few minutes. Straight grain is applied with a pencil over-grainer, or with a thin over-grainer divided by drawing a coarse hair-comb through the bristles.

When dry, the job is completed with one coat of varnish (Fig. 92).

Maple (Grained in Water-Colour)

As in pine, the colour of this wood may be cool, or warm, as desired. In both cases the varnish will impart a yellowish hue, which must be allowed for when mixing the stain. Raw sienna may be added if the creamy colouring of old work has to be matched, otherwise a colour similar to vandyke brown is usually mixed from burnt sienna and black. It is of the utmost importance to keep the stain pale in tone; this is ascertained by trial until the glaze is just dark enough to show the mottling.

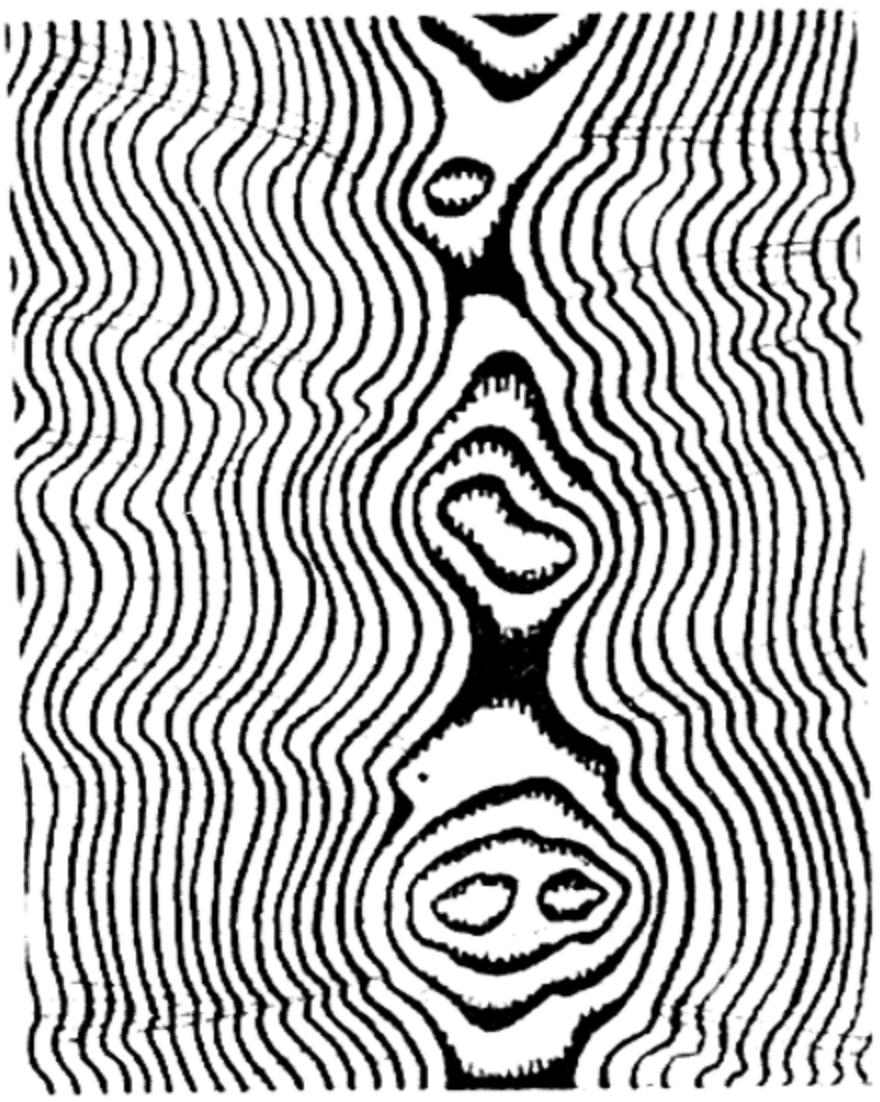


FIG. 93

Two varieties of maple are generally used side by side in a room; the first, "bird's-eye maple," being employed for door panels, while the plainer type, "curly maple," is employed upon other surfaces. Bird's-eye maple can be grained very rapidly by the following method: Rub in the glaze, liberally and evenly, then rag-roll with a damp wash-leather (twisted to produce oblique lines) and soften horizontally with a badger. Introduce the bird's-eye dots by stippling lightly and rapidly with the finger-tips whilst the mottling is still wet, and again soften. Sketch the curly grain upon the dry surface with a light brown crayon, but do not cross over any dots—skirt round the edges (Fig. 93).

In curly maple the mottle is softened until barely discernible, and eyes are entirely absent. Grain is applied with the crayon, keeping to simple shapes as commonly found in heartwood generally. Finish with one coat of the palest varnish procurable.

From experience gained in the working out of these examples it should be possible to examine any variety of timber and to assess and memorise its characteristics in terms of technique and colour, and, if necessary, to make a creditable attempt at its reproduction. Additional depth and richness of effect can always be improved by an extra coat of glaze and varnish.

French Polishing

As this is a highly specialised job we would advise the amateur to try his hand on small articles, and not to run before learning to walk. All the processes connected with staining, stopping, and grain-filling will prove particularly useful in providing a suitable ground for french polish, but the polishing of painted and grained surfaces is not recommended.

Surface preparation is important in this as in other high-gloss finishes, and the object of such preparation is to produce the smoothest possible ground and to ensure cleanliness and dryness. Old work in fair condition need not be stripped; a wash down with dilute sugar soap, followed by a clean rinse, will prove sufficient, but should there be evidence of furniture or wax polish on the work this MUST be washed off with clean rag and white spirit, otherwise the new polish cannot adhere.

If the old surface has worn thin in places, or is badly chipped or perished, it is quicker and easier to strip off the old polish and start anew rather than attempt the slow and difficult task of touching-up or otherwise restor-

ing the work. A spirit paint remover or strong solution of sugar soap will soften the whole thickness and simplify its removal by scraping (see p. 87).

The materials, etc., required in the actual polishing operation are: refined linseed oil, methylated spirit, spirit soluble dyes (stains), brown or white french polish, plastic wood (for minor repairs), No. oo glass-paper, clean calico free from lint, cotton wool, and one or two camel-hair mops. French polish can be obtained ready for use, or prepared by dissolving 6 ounces of best orange shellac in 1 pint of methylated spirit, methylated finish, or industrial alcohol. This is quite ready for use in about twenty-four hours. The addition of a little gum benzoin does not affect its working qualities but does improve gloss.

New woodwork is ready for polishing immediately the stain is dry, or—if the natural colouring of the wood is preferred—after the completion of preliminary cleaning, smoothing, chemical staining, and, if necessary, grain filling. Rust or ink stains must be bleached out by repeated applications of dilute oxalic acid to the affected parts, finally sponging with clean water. When dry, excessive porosity is checked by the application of linseed oil, rubbed in sparingly with a pad of clean rag and allowed to harden overnight.

New surfaces require " bodying-up " with two coats of half-strength polish—*i.e.*, equal parts french polish and methylated spirit, applied with a camel-hair mop. The work must be carried out in a warm atmosphere, keeping doors and windows closed, to exclude draughts of cold air which might cause the material to dry with a permanent white bloom. It is equally risky to work too close to an open fire because heat may cause blistering. Furthermore, the inflammable nature of french polish must not be forgotten.

Since the polish dries too rapidly to prevent crossing and laying off as in painting, a different technique is required. The work is carried out in sections, each of which is coated in a series of narrow strips (approximately brush width) extending the full length of the area concerned. If the first is applied in a left to right direction the remainder must follow in the same direction and as quickly as possible, otherwise the edge may set and cause a ridged surface when joined up to the following strip.

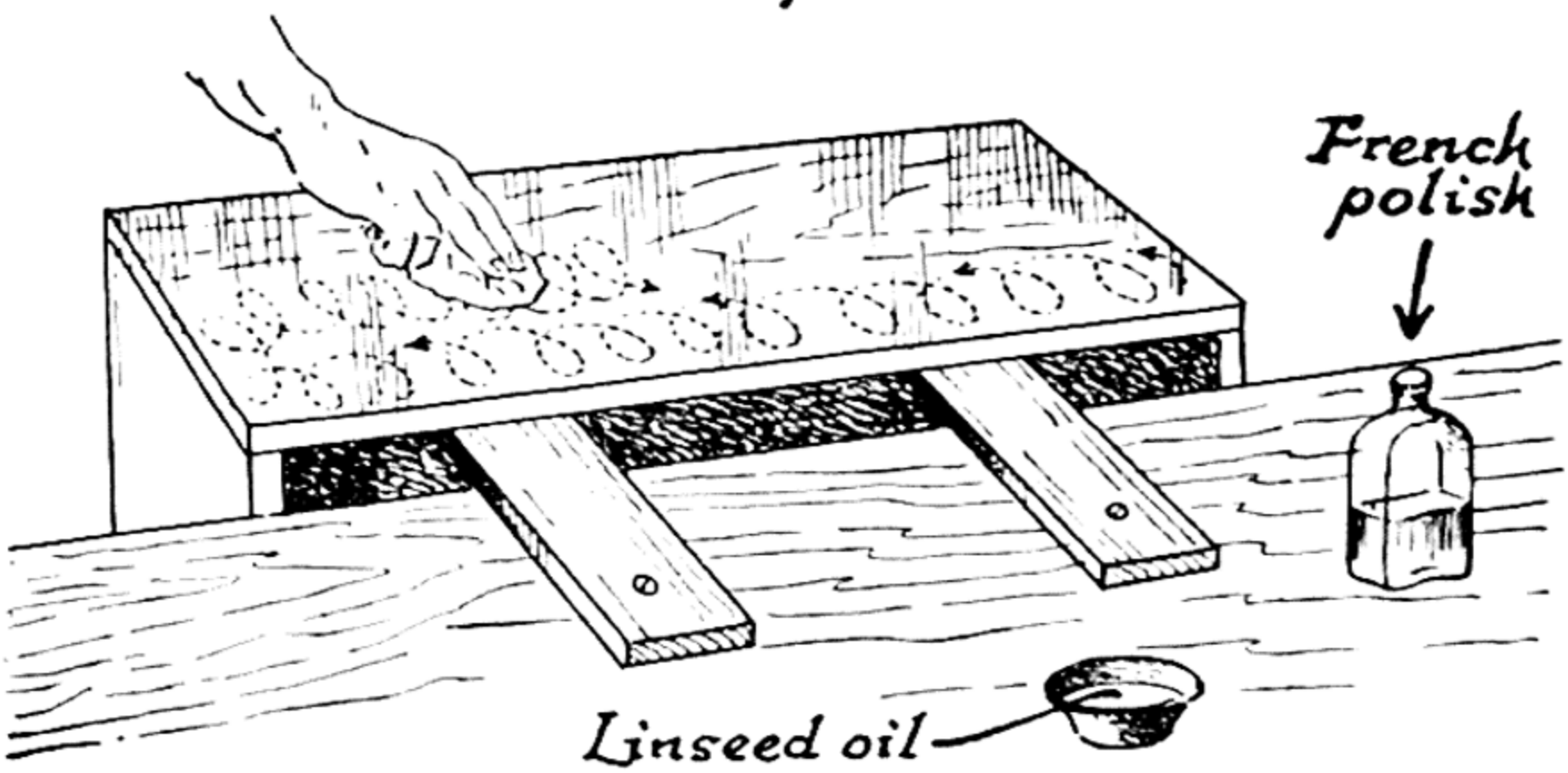
In order to secure greater freedom in working, it is always advisable to dismantle all detachable parts, such as handles, shelves, drawers, etc., and to complete the polishing before reassembling. Allow ample time—about two hours—for the drying and hardening of each coat, and glass-paper smooth before proceeding. A cork block can be held inside the glass-paper to ensure more effective levelling of the surface. The brushes, when not in use, should be kept in an airtight jar containing a wad of cotton wool saturated with methylated spirit: under these conditions they remain soft and ready for instant use.

Following coats of polish should be applied with a rubber prepared by wrapping a wad of cotton wool inside two layers of smooth calico. The wool is kept moist with half-strength polish, applied at intervals to the upper surface, which means unwrapping the rubber for each application. When in use, the polish flows slowly to the working face of the rubber and thence to the surface covered. Variations in pressure will increase or reduce the flow, but generally speaking it is better to apply too little than too much polish.

Since this process should aim at levelling the surface and filling up all open pores and inequalities of grain, the rubber must be employed in a manner likely to

achieve this end—*i.e.*, in a circular direction as illustrated (Fig. 94). It should be kept on the move, and, to assist smooth working, may be moistened at intervals with one drop of linseed oil. As a rule, the pressure must be light when the rubber has been newly charged, and increased as the polish flows more slowly. On no

Fig. 94



French Polishing.
Illustrating the direction followed by the rubber. In this instance a shallow drawer is held securely and at a suitable height against the bench.

account must the working face be allowed to form wrinkles or ridges, nor must it "stick" to the surface during use.

Each coating is glass-papered when hard, to remove rubber marks; then, as the surface is levelled, the polish is thinned down to one-third strength and applied in a fairly dry condition in a series of straight strokes conforming to the direction of the grain. This removes any marks left from the previous operation, and improves gloss; no oil is used at this stage.

The final stage—known as "spiriting off"—is carried out with a clean rubber, barely moistened with methylated spirit only. The working face should appear uniformly dry and free from traces of spirit which would produce dull streaks on the finished work. This is applied in the direction of the grain, and it will be found that little more than spirit vapour and the lightest pressure is sufficient for this final polish. When not in use, the rubber may be stored in a small airtight tin.

Old surfaces are often rather faded in appearance, or may have developed a whitish bloom during washing down. It is usual in such cases to restore richness of colour by the use of polish slightly tinted with spirit stain. The latter is also useful for touching-up any repairs of plastic wood before proceeding to polish.

Spirit stains are available in powder form and are dissolved in methylated spirit before admixture with french polish. They include aniline powders of almost every colour; proprietary brands blended to represent mahogany, oak, walnut, etc., and others described as spirit black, dragon's blood, Bismarck brown, turmeric, etc., any of which may be intermixed to produce intermediate tints. Bismarck brown and dragon's blood give powerful red stains, suitable—if toned down with black—for mahogany, and turmeric (yellow) can be darkened with spirit walnut to give a full range of oak colourings.

Polishing is commenced with one coat of brush-applied material, after which the work is continued on the lines specified for new surfaces.

The Treatment of Floors

There is a tendency to overlook the possibilities of various treatments which might well be exploited for the preservation and decoration of floors. We are accus-

tomed to think of floor coverings in the terms of oilcloth, linoleum, or carpets, all of which are relatively expensive when compared with floor paints and varnishes. A stained and varnished floor surround remains in good condition for five or six years, provides no harbourage for dust, and can be obtained for the price of 1 pint of stain and 1 quart of floor varnish—the equivalent of about 2 yards of lino.

Wood floors can be scrubbed clean, and, when dry can be stopped with putty, stained with oil stain, coated with gold-size and turpentine, and finished with floor varnish; an operation which is spread over three days. In new houses, the floors may be cleaned and twice varnished to produce an attractive natural wood finish, but in old buildings, the use of a very dark stain may be necessary to hide imperfections of surface.

Wax polishing will maintain a stained or varnished floor in good condition, but will also prevent washing and re-varnishing at a future date. It is advisable to use one of the cedar-oil polishes upon varnished work, as this permits re-varnishing if required.

Work can be expedited by the use of spirit stain, or water stain, either of which may be varnished the same day, then coated with weak jellied size on the morning following and varnished some four hours afterwards. These stains should not be used in conjunction with linseed-oil putty, but will be quite satisfactory if nail-holes and cracks are stopped with a mixture of distemper and plaster of paris, tinted to match the general tone of the bare wood. All the foregoing are preferable to ready-made varnish stains, which fail to penetrate and are liable to chip or flake.

Floors give reasonable service when painted, brush-grained (or stippled) and varnished—a treatment which offers considerable variations in colour. Alternatively,

there are several proprietary paints made specially for use upon oilcloth, linoleum, or wood flooring; these are available in several colours which dry rapidly and give a hard-wearing surface. Since oilcloth is composed of oil paint reinforced with canvas, there appears to be no reason why hard-drying paints of the Chinese lacquer type should not be employed in the renovation of floors and floor coverings.

Whatever the treatment employed, the job must be commenced at a point which enables the operator to work towards the normal exit—the doorway. If a surround (margin) is to be painted, furniture is placed in the centre of the room and, on completion, a short plank may be placed upon a couple of cross-pieces—each resting upon unpainted parts—to form a temporary means of access.

Cement floors must be allowed to dry out thoroughly before sealing up the surface with paint or wax polish. The latter is available as a coloured (brick-red) paste and is equally suitable for cement, brickwork, terra cotta tiles, and composition flooring. Portland cement requires specially compounded floor paints which harden as well as colour the surface, give a tough, hard-wearing finish, and prevent the formation of dust.

High-class composition floors which present a pale mottled surface should receive an occasional dressing of transparent floor polish.

PART III

INDIVIDUAL ROOMS

CHAPTER VII

THE DECORATION OF VARIOUS ROOMS

Colour schemes and suggestions for bedrooms, bathrooms, nurseries, staircases, dining and reception rooms, kitchenettes, etc.—Colour ingredients; mixing and matching.

FIRST, let us consider the main factors which contribute directly or indirectly to the success of a colour scheme. If we already have a good eye for colour, so much the better, the subject will prove none the less interesting when approached from different angles. To others we would suggest that the development of a colour sense—*i.e.*, the ability to plan successful schemes—can be acquired by observation and attention to the following points:

Generally speaking, the large areas—*i.e.*, ceilings and walls of rooms—should be cheerful, warm, and pale in tone. Strong colours appear harsh and assertive when applied to walls, but are successful when reduced with white to form tints, or when used in small amounts for lining, shading, stencilling, etc., or when used upon woodwork. The colour should be appropriate and entirely suitable for the type of room; bedrooms and reception rooms being decorated with pale tints; kitchens, bathrooms, and halls with brighter tints, and dining-rooms with deeper and warmer hues.

The size and proportion of a room may call for modifications in colouring to correct or disguise some undesirable feature, such as excessive height, or lack of height or width. A coloured ceiling appears low and a white ceiling gives an impression of height; similarly, dark

toned or brightly coloured walls tend to make a room appear small, while pale colours have the opposite effect.

The presence of a cornice, picture-rail, frieze, or dado (see Fig. 101) will also affect the apparent proportions of a room. When these horizontal divisions are strongly defined a room tends to appear spacious and reduced in height, but the latter can be controlled by painting the picture-rail with the wall colour and treating the cornice and frieze in a paler tint of the same colour; the ceiling to be little more than broken white (white, with a touch of the wall colour). In the absence of a frieze, a low room can be improved by keeping the ceiling pale, and painting the cornice with the wall colour. On the other hand, a high-pitched room is modified by using a stronger tint for the ceiling and cornice.

In addition to the foregoing modifications it is often necessary to tone down the more assertive tints and, in a few cases, to brighten or strengthen others lacking in brilliance. Hues containing red and yellow are warm in effect and when used at or near their full strength are natural advancing colours. Where blue predominates, such colours are cool, retiring, and quiet in effect, but the latter quality is completely reversed when white is added to form tints of purple, blue, or bluish-green.

Fortunately, the warm colours—red, orange, yellow, and yellowish-green—react very favourably when reduced with white. Whilst retaining their warmth, such tints become less assertive as the proportion of white is increased. Lilac, sky-blue, and pale turquoise are tints prepared from purple, blue, and bluish-green, respectively. The addition of white develops considerable brilliance, with the result that these retiring hues may become altogether too positive—sometimes to the point of harshness—and, unless assertiveness is required, they

should be rendered more neutral before application to large areas.

A harsh colour can be softened by either of two methods: (*a*) by the addition of a small percentage of its complementary colour (see p. 265), or (*b*) by admixture with pale grey (white tinted with black and a little burnt umber) to produce a pastel tint. The advantages of this power to soften or neutralise any colour will be fairly obvious; it widens our field of choice, and provides a means whereby advancing or powerful hues can be controlled and rendered more suitable for ceiling or wall decoration.

Since the effect of any colour depends upon the amount and type of lighting, it is better to choose (or mix) colours in the proper surroundings—*i.e.*, in rooms where they are to be used. Perhaps it is natural to take advantage of the best lighting conditions, but it should be realised that colours selected in daylight, near a window, will appear darker when applied to a wall or ceiling on the opposite side of a room. This difference in tone is particularly marked in the case of ceilings, which means, of course, that the effect of a colour should always be judged in the exact position it is to occupy.

Similarly, the effect of artificial light should not be overlooked and, as the majority of private houses are illuminated by electricity or gas—both of which are yellowish in character and deficient in blue rays of light—colours should be examined under both conditions. The following indicates the effects of artificial light on colour:

Yellow appears pale and washy.
Yellowish-green appears normal.
Orange appears brighter.
Red appears brighter.
Crimson and purple appear redder.
Dark blue appears darker.
Prussian blue appears greener.
Bluish-green appears greener and darker.

(*Note.*—Daylight fluorescent lamps show the various colours as nearly as possible in their true values.)

Even daylight is by no means constant, the quality varying with the time, season, and, most important of all, with the position of each room. Because of this variation it is advisable to decorate northern and other sunless rooms with warm cheerful tones of yellow, cream, orange, pink, tan, old gold, etc., reserving cool tones of blue, green, white, grey, and lavender, for the more sunny rooms.

The coldness of the latter group can be modified to some extent by admixture with other pigments; yellow being employed with greens, and crimson with the blue pigments. It is, however, most unwise to attempt these minor alterations until (by preliminary trial on a palette board) we have ascertained the strength, effectiveness, and general suitability of the tinting colour.

Colour schemes must also be planned with due regard to furniture, carpets, hangings, tiled fireplaces, etc. These may form a basis around which a harmonious arrangement can be built up, or, if the colours are dissimilar or at variance with the desired wall treatment, it may yet be possible to incorporate all the different hues successfully.

Planning a Colour Scheme

Perhaps it will be as well to begin by thinking in terms of pure bright colours arranged in the form illustrated (Fig. 95), with the palest colour (yellow) at the top, and the darkest colour (blue-violet) at the base. Between these two extremes are a number of intermediate hues ranging from pale colours at the top and becoming successively darker towards the base.

This colour circle illustrates several relationships: (*a*) colours on the right are related by the presence of

red, and those on the left by varying amounts of blue; (*b*) there is a tone relationship which links the colours on either side by a series of graduated light to dark tones, each of which must occupy its definite place to preserve the orderly sequence. This is known as the natural order of colour. (*c*) The circle is arranged with contrasting hues exactly opposite: these are often termed complementary colours because each pair can be combined to produce neutral grey and, theoretically, the sum total of their combined light rays should contain all the components normally found in the rainbow.

Monochromatic schemes are simple arrangements involving the use of several tones of any one colour. To be effective there must be sufficient contrast between the different tints and shades. The chief difficulty associated with this type of scheme is that of getting everything to match. If this is not possible, any slight variations in colour should conform to the natural order of colours —*e.g.*, in a scheme based on green the paler tints incline towards yellowish-green and the darker tones towards bluish-green. To reverse this order results in discord. One green should be employed throughout, and varied by the addition of white or light grey to give the contrasting tones required.

Analogous harmony employs neighbouring colours selected from any part of the colour circle. These, along with their tints and pastel tints, are more interesting than monochromatic combinations: both are quiet in effect and suitable for bedrooms.

To ensure harmony each colour must be used in its correct tone strength, keeping the bluish colours darker and yellowish colours lighter, in accordance with the natural order. All can be lightened, darkened, or reduced with warm grey so long as the tone values are not reversed. In every case it will be safe to darken the

deepest colour or lighten the palest colour, as such alteration does not constitute any breach of the foregoing rule.

The same rule applies with equal force to all the darker shades of ready-mixed paint. There are, for example, many tones of green, brown, red, and blue, some inclining towards warmth, others approaching the cool end of the colour scale. Brown requires particular care if it is to take its proper place in a scheme, for colours such as self oak, tan, teak, and others approximating to dark tones of yellow will certainly appear harsh and discordant if used with paler tones of red, blue, bluish-green, etc., which are darker in the colour circle. This means that in any scheme involving the use of two browns the paler tone should incline towards yellow and the darker tone towards red.

The complementaries, red and bluish-green, present another problem; both being equal in tone and half-way between the palest and darkest colours, it would appear that the addition of white to one and not to the other would produce either pink and blue-green, or pale blue-green and red; both being too harsh for general use in large masses.

And yet, since contrast of tone is an essential feature of any scheme, we cannot always follow the usual method of adding equal amounts of grey (or white) to soften the harshness of these colours. We can, however, use a pale yellowish-green with deep reddish-brown, to very good effect, providing that the green occupies the larger area —*e.g.*, green walls with a low dado (or woodwork) in dark brown. Other complementary pairs exhibit noticeable differences in tone and are thus easier to deal with. They, too, can be softened by admixture with white, grey, black, or other unrelated colour, or by adding a little of each to the other.

Complementary colours are extremely valuable for brightening up any monochromatic or analogous scheme which may appear too quiet or lacking in colour contrast. In such cases only a very small amount is required and the colour can be used at full strength or may be broken or softened, according to the degree of contrast desired.

A good effect is secured by using three neighbouring colours along with the complementary of the central hue—*e.g.*, orange, yellow, and yellowish-green, with blue-violet as contrast. All can be reduced with white or pale grey, and lines, borders, etc., painted in full-strength colour. Similarly, a monochromatic arrangement can employ more than one contrast, as, for example, yellowish-green may be used with crimson and blue-violet, instead of its true complementary, purple.

Another method which secures a great amount of colour interest employs colours equidistant in the colour circle—*i.e.*, at 120° apart. Schemes based upon this equilateral arrangement are well balanced and give a sense of completeness equal to the complementary combinations. In common with other schemes, one colour should predominate either in area or intensity and the others should be toned down with pale grey, avoiding the production of discord. An example of this arrangement might include orange, purple, and bluish-green, each made considerably paler, but still retaining their natural tone strength.

Some important rules concerning the application of these ideas can now be considered:

(1) As a general rule, the warm hues should dominate —*i.e.*, should cover a greater area than cool colours employed in the same scheme.

(2) Since the wall areas are a prominent feature of any room and form a background for furnishings, they

should be treated in soft tints, relieved—if desired—with small amounts of brighter colour.

(3) Contrast of tone is coequal with that of colour in giving life and vitality to a scheme. The smaller area occupied by woodwork provides a suitable place for contrasting tones; alternatively, graduated colour, scumbling, rag-rolling (see p. 220), etc., may be employed with considerable advantage upon walls.

(4) Discords and pure colours can be used with success, providing that these are reserved for small details of pattern, lines, borders, etc. Controlled discord can supply an unusual and distinctive touch to the most orthodox scheme.

(5) Lavender-blue, blue-grey, and other colours which tend to lose their colour value in artificial light can be enhanced by the effect of coloured light. A rose-coloured lampshade, or several wall lights, add considerably to the impression of warmth and unity.

(6) Woodwork can be grained to match the existing furniture, or, if painted, the doors may be treated in one colour, and casings, skirting, and other narrow widths in a different hue or tone. This latter method appears to have superseded the old two-colour treatment of doors except, perhaps, for exterior work.

Successful schemes have been suggested by the harmonious and contrasting studies found in natural forms such as flowers, butterflies, the plumage of birds, etc., but whether we seek inspiration from these sources or not, the final decisions should be made after reference to the colour circle, conditions of lighting, aspect, and other relevant points. Our choice may be somewhat limited by the presence of carpets and other soft furnishings, and in this event we must build up a scheme capable of harmonising with the dominant hues.

It is generally a case of using several neighbouring colours—with, or without a complementary—or one colour with a split complementary (two near contrasts), or, in more difficult circumstances, we can employ three equidistant hues. The aim should be the establishment of unity and adequate contrast of tone—a problem with many solutions.

Should there be any difficulty in making a satisfactory selection, it may be possible to find a wallpaper which displays the range of tints necessary for unifying the whole. In this instance, the woodwork might well be painted to match one or two of the hues predominating in the paper.

Illusory Effects of Colour

The peculiar reaction which takes place when different colours are employed together is not generally appreciated, and, because of that fact, many schemes lack the restful effect which should—according to the laws of harmony—be present. These reactions may affect the appearance of colours in any of three ways: (*a*) in tone, (*b*) intensity, and (*c*) in hue.

(*a*) When a pale colour is placed against one of darker tone, the first appears paler and the second appears darker. A pattern can be outlined with black or other shade to intensify the colours employed, or outlined in white to secure the opposite effect. Similarly, a painted wall can be made to appear paler or darker, according to the degree of contrast between walls and woodwork.

(*b*) Complementary colours always appear much brighter when used together, and, in the case of pale and dark pairs, the tone value is also affected.

(*c*) When colours other than complementary pairs are placed together, each appears to induce its comple-

mentary in the other. This can easily be proved by placing a 2-inch square of red paper upon a yellow background and comparing the effect with another square placed upon a deep blue ground. The two reds will appear widely different; the first inclining towards crimson—influenced by the contrast, blue—and the second towards orange—the complementary of the blue ground. The background immediately adjoining each square will also incline towards the complementary of red (bluish-green).

The same change occurs when a colour is placed upon white, grey, or black, but since this induced contrast is expected, we add a touch of the superimposed colour, which effectively prevents the change, no matter what colours are employed. It is because of this reaction that widely different colours must conform to the natural tone strengths, otherwise, in pairs, such as orange and turquoise, the orange induces a darker contrast, and turquoise a paler one, requirements which can only be met when the correct tone difference already exists.

Schemes for Various Rooms

In the application of the foregoing rules we have followed the general principles involved and have made full use of the colour circle for selecting and deciding the tone value of the hues employed. In almost all the schemes suggested we have endeavoured to secure a happy combination of harmony, cheerfulness, and cleanliness of hue, with the right amount of contrast. Other items, such as lampshades, cushions, and upholstery, might well conform to one of the principal colours used in decoration: a precise match is not essential.

One difficulty has been that of describing the various tints employed. Those marked with an asterisk are

standardised on the colour charts 381C: 1944, and 381WD: 1945, of the British Standards Institution, 28 Victoria Street, London, S.W.1. The cost is 1*s.* 6*d.* per pair, post free. The remaining tints were selected from some half-dozen colour charts issued by well-known paint manufacturers, and, for those wishing to make up their own paints, we have given the names of paste pigments capable of producing a fair match to the colours described.

Although the majority of paste pigments appear dull and lacking in purity, they produce a delightful range of soft, pastel tints such as would result from the bright hues of the colour circle reduced with the pale grey. This means, of course, that tints can often be matched from pure bright colours as well as from less bright pigments. It is always advisable to try out the effect of pigment mixtures upon a palette board, noting the staining strength of each colour, and the amount used in proportion to white, then, when some confidence has been gained, it should be possible to deal with larger amounts.

It is a good plan to prepare pale tints on the following lines: Take sufficient white paint for the area concerned (1 lb. covers approximately 5 square yards of surface), mix each tinting colour to a fluid consistency and add a little at a time, stirring with a clean stick to develop the colour. It will be found that 1 per cent. of pigment is sufficient to tint the white, and that 2 per cent. gives a strength adequate for walls. A deeper range of tones, suitable for woodwork, is obtained by the addition of 5 per cent. of the staining pigment.

Since the staining power of different colours will vary according to quality and depth of hue, the foregoing percentages must obviously be regarded as averages. Tube oil colours as used by artists are usually stronger,

and some of the commercial oil colours used by decorators are often less powerful than the 100 per cent. pure staining pigments we have in mind.

Now for the more subtle differences which must be appreciated before attempting to match colours. A brief survey of any colour chart, as, for example, those issued by Messrs. Winsor and Newton, Ltd., makes it clear that three primary colours—red, yellow, and blue—can hardly be expected to produce the intermediate colours, orange, green, and purple, in the state of purity required. There are more than ten varieties of reds, greens, and yellows; eight blues; five purples, and two distinct hues of orange, each group including warm, medium, and cool colours.

We know that red and yellow make orange; yellow and blue make green, and blue and red give purple, but the right pigments must be employed, otherwise the mixed colours may be dull and lifeless. A bright orange can be produced from deep or middle chrome yellow (or cadmium yellow) and scarlet red, but not from lemon chrome and crimson red. The latter inclines very slightly towards purple, and this is quite enough to damage the purity of orange. Bright green should be prepared from Prussian blue and yellow (or lemon) chrome, both of which incline towards green. On no account should ultramarine blue or cadmium be employed, since both are too red.

Purple presents something of a problem, because ultramarine blue and crimson (or purple) lake—both inclined towards the desired hue—are not sufficiently pure to give a really bright purple. They produce a good range of mauve, lilac, and lavender pastel tints, but do not compete with mauve or magenta oil colours as far as brilliance of hue is concerned.

Other pigments show similar tendencies when reduced

with white; the following table indicates the general reaction of each:

Pigment.	Colour Tendency.
Yellow ochre.	Towards red.
Raw sienna.	Towards red.
Scarlet vermilion.	Towards yellow.
Bright red.	Towards blue.
Venetian red.	Towards yellow.
Indian red.	Towards dull purple.*
Light Brunswick green.	Towards yellow.
Middle Brunswick green.	Little change.
Deep Brunswick green.	Strongly blue.
Vandyke brown.	Towards red.
Raw umber.	Cool brown.
Burnt umber.	Towards red.
Burnt sienna.	Strongly red.

* This pigment produces harsh tints lacking in purity, and is seldom employed in pale tints. All pigments (except vandyke brown) in the foregoing table may be intermixed with each other and with white lead or zinc white, without fear of discoloration. The pigments liable to cause trouble are cadmium yellow (or orange) and ultramarine blue. These damage the colour of white lead, lead chrome, Brunswick green, and Emerald green, but if these combinations are avoided, others can be mixed with reasonable safety.

Colour matching is based mainly upon experience in colour mixing, but this should not deter the amateur. The majority of colours can be matched—on a palette board—perhaps not at first attempt, but usually in something less than an hour. The following schemes cover a wide range of tints and their colour ingredients, the study of which might well assist in the production of closely related hues.

		Pigments Employed
	Bedroom (Sunless). No. 1.	
Ceiling.	Ivory.	White, broken with chrome yellow.
Walls.	Primrose.	White, and chrome yellow.
Woodwork.	Maple.	White grained with raw sienna and raw umber.
Carpet.	Soft grey-blue:	Patterned with cream and old gold.
Curtains.	Old gold.	
	Bedroom (Sunless). No. 2.	
Ceiling.	Pale cream.*	White, broken with yellow ochre.
Walls.	Pale salmon* pink.	White, Venetian red, and yellow ochre.
Woodwork.	Opaline green.*	White, mid-Brunswick green, and Prussian blue.
Carpet.	Deep rose.	
Curtains.	Rose.	
	Bedroom (Sunny). No. 3.	
Ceiling.	Broken white.	White, broken with light Brunswick green.
Walls.	Eau-de-Nil.*	White, light Brunswick green, and chrome yellow.
Woodwork.	Pale mauve.	White, crimson lake, and ultra-marine blue.
Carpet	Sage green.	
Curtains.	Sage green.	
	Bedroom (Sunny). No. 4.	
Ceiling.	Pastel blue tint.	White, broken with Prussian blue.
Wllas.	Ash grey.	White, black, and Prussian blue.
Woodwork.	Chamois.	White, chrome yellow, and burnt umber.
Carpet.	Silver grey.*	
Curtains.	Silver grey.	
	Nursery.	
Ceiling.	Pastel blue tint.*	White and Prussian blue.
Walls.	Banana.*	White, chrome yellow, and ochre.
Dado.	Turquoise blue.	White, deep Brunswick green, and chrome yellow.
Woodwork.	Coral red.	White, Signal red, and chrome yellow.
Carpet.	Peacock blue.*	
Curtains.	Coral red or turquoise.	

		Pigments Employed
Bathroom. No. 1.		
Ceiling.	French beige.*	White, burnt sienna, and chrome yellow.
Walls.	French beige.	
Woodwork.	Shell pink.*	White and Signal red.
Floor.	Pale turquoise blue.	
Curtains.	Coral red.	
Bathroom. No. 2.		
Ceiling.	Broken white.	White and ochre.
Walls.	Pastel green.	Rag-rolled upon a broken white ground.
Woodwork.	Opaline.*	White, light Brunswick green, and Prussian blue.
Floor.	Terra cotta.*	
Curtains.	Opaline.	
Hall and Staircase. No. 1.		
Ceiling.	Cream.*	White and yellow ochre.
Walls.	Portland stone.*	White, chrome, and burnt umber.
Doors.	Bleached oak.	Ivory, grained with raw umber.
Other woodwork.	Silver grey.	White, black, and chrome yellow.
Carpet.	Terra cotta.	
Hall and Staircase. No. 2.		
Ceiling.	Cream.*	White and yellow ochre.
Walls.	Champagne.*	White, ochre, and Venetian red.
Doors.	Champagne.	White, ochre, and Venetian red.
Other woodwork.	Corn husk.*	Chrome, burnt umber, and white.
Carpet.	Azure blue.	
Lounge. No. 1.		
Ceiling.	Pale flesh pink.	White and salmon.
Walls.	Parchment.	White, ochre, and raw umber.
Wall panels.	Salmon.*	White, Venetian red, and chrome. (Stippled over parchment.)
Woodwork.	Salmon.*	
Carpet.	Myosotis blue.	
Curtains.	Coral.	

		Pigments Employed.
Lounge. No. 2.		
Ceiling.	Ivory.	White and chrome.
Walls.	Pastel green.	White and pale Brunswick green.
Woodwork.	Stone.	*White, chrome, and raw umber.
Carpets.	Bright terra cotta.	
Curtains.	Pastel green.	
Dining-Room. No. 1.		
Ceiling.	Ivory.	White and ochre.
Walls.	Light Eau-de-Nil.*	White, light Brunswick green, and chrome.
Woodwork.	Honeysuckle.*	White, chrome, and raw umber.
Carpet.	Maroon.	
Curtains.	Bluish-green.	
Dining-Room. No. 2.		
Ceiling.	Pale cream.*	White and ochre.
Walls.	Old gold.	White, ochre, and Venetian red.
Woodwork.	Medium oak.	Grained with burnt umber, and flat varnished.
Carpet.	Wedgewood blue.	
Curtains.	Deep gold.	
Kitchen (Sunless). No. 1.		
Ceiling.	Pale primrose.	White and lemon chrome.
Walls.	Pale lemon.	White and lemon chrome.
Woodwork.	Lemon.*	White and lemon chrome.
Wood mouldings.	Canary.	White, yellow chrome, and raw umber.
Floor.	Russet.	
Curtains.	Red.	
Kitchen (Sunny). No. 2.		
Ceiling.	Broken white.	White and burnt sienna.
Walls.	Portland stone.*	White, chrome, and raw umber.
Woodwork.	Marigold.	White and burnt sienna.
Floor.	Sage green.	
Curtains.	Light green.	

		Pigments Employed.
	Kitchen. No. 3.	
Ceiling.	Ivory.	White and ochre.
Walls.	Almond green.	White, chrome, and light Brunswick green.
Woodwork.	Chamois.	White, ochre, and raw umber.
Floor.	Terra cotta.	
Curtains.	Cream.	

(* Indicates B.S. colours.)

(*Note.*—Since the foregoing pigments are paste colours ground in oil, they are limited to use in oil paint only. With the exception of Prussian blue, Brunswick green, and chrome yellow, all are equally suitable for tinting distemper, but for this purpose must be obtained in powder form, or as a stiff paste ground in water. These, together with lime blue, lime green, Dutch pink (pale yellow), and zinc chrome, are obtainable from decorators' merchants.)

CHAPTER VIII

THE PRACTICAL TREATMENT OF INDIVIDUAL ROOMS

Co-ordinating all essentials, arranged in order of sequence and applied to the re-decoration of various rooms.—Tools, materials and equipment required at each stage.—Detailed instructions supplementing the foregoing text.—Decoration of staircases, etc.—Enamelling a bath.—Treatment of hot-water pipes and radiators.

HERE the necessary essentials are co-ordinated, arranged in order of sequence, and applied to the re-decoration of various rooms. Tools, material, and equipment are enumerated at each stage, and all processes supplementary to the foregoing text are adequately dealt with.

BEDROOM (NO. 1) (FIG. 96)

Let us assume that the room is rectangular in shape, with ceiling and frieze conjoined by a curved angle and previously distempered. The walls are now papered, and the woodwork is finished in high-gloss paint which, except for a blistered window-frame, is in fair condition.

To re-decorate on similar lines is not a difficult task, but because of the large expanse of ceiling and frieze the distempering of these areas is a two-handed job. Future decoration can be facilitated by the simple expedient of panelling the ceiling with a 1-inch border of "Lincrusta" or "Anaglypta", applied to form a rectangular shape with each side about 1 foot distant from the wall. This arrangement enables distempering or painting to be executed single-handed and in a more leisurely manner. The walls can be papered and panelled, and the woodwork painted and grained to suggest maple.

Before any preparatory work is commenced we must

discover what type of distemper has been employed. This is quickly ascertained by rubbing the surface with a wet cloth, which removes size-bound and semi-washable distempers, but has no effect upon oil-bound distemper and flat oil paint. The latter pair are to be washed down with dilute sugar soap, followed by a rinse with clean water; non-washable distemper is completely removed with warm water alone.

It is proposed to prepare, panel, and finish the ceiling in washable distemper; strip, paper, and panel the walls; grain the woodwork to represent maple—gloss finish, and, to improve the general appearance and facilitate cleaning, a quarter-round oak bead is to be fixed at the angle between floor and skirting. The various operations are given in order of sequence, and, where these have already been explained in detail (see Chapters IV, V, and VI), the work is covered in specification form, as follows:

(1) Ceiling and frieze: wash down, repair defects to plaster, and glass-paper any rough places.

Equipment, etc., required: Dust sheets, buckets, distemper brush, sponge, floor cloth or mop, warm water, sugar soap (for a ceiling treated in washable distemper), broad scraper, small trowel, Keene's cement, or plaster of paris and size-water, mixing board for plaster, No. 2½ glass-paper, and cork block. A builders' plank and two step-ladders will also be necessary.

(2) Walls: soak and scrape off old wallpaper: wash down to remove paste, size, etc., repair defective plaster; glass-paper; coat with weak jellied size, and then mark out the areas to be occupied by borders, using coloured chalk and a chalk-line.

Equipment required: As before, supplemented by chalk, string, 2-foot rule, and plumb-bob and -line.

(3) Woodwork: rub down with "Strippabloc" or other

pumice block containing soda, using No. 1½ waterproof glass-paper for mouldings; rinse with 2 per cent. solution of vinegar and then with clean water; dry off with a wash-leather, and dry the floor with a mop.

Equipment required: Sponge or swab, old distemper brush, dilute solution of sugar soap.

(4) Strip off defective paint from window-frame after treatment with paint remover; wash with turpentine substitute and clean rag, to remove traces of wax; glass-paper; treat knots, and prime.

Equipment required: Spirit paint remover and old paint brush; broad scraper, chisel knife, and shave-hook; white spirit and clean rag; No. 1½ glass-paper; dusting brush, shellac knotting and brush; white-lead paint and 1-inch paint brush.

(5) Wash floor, and (6) fix angle bead to base of skirting; prime new woodwork with white-lead paint.

Equipment required: Saw, mitre block, 2-foot rule, lead pencil, bradawl, panel pins (1 inch), hammer, paint, and flat fitch.

Ceiling

(7) Apply one coat of oil-bound distemper to ceiling and frieze, then, when dry, mark out guide-lines for ceiling panel—single lines are struck to run parallel with and 1 foot away from each wall.

Equipment required: Oil-bound distemper (Ivory), petrifying liquid, water, bucket, mixing stick, 6- or 8-inch distemper brush, steps and plank, floor mop, white chalk, chalk-line (string), and 2-foot rule.

(8) Prepare cold-water paste from dextrine flour; trim selvedges from "Lincrusta" border; measure and cut up into lengths required; apply dextrine paste (with palette knife), and, when tacky, hang the various lengths to existing guide-lines: press firmly with a damp cloth

to secure perfect adhesion, and employ pins to hold down any parts which tend to curl away from the ceiling.

Equipment required: Scissors, flexible knife, 2-foot rule, pins, small hammer, dextrine paste, clean cloth, and water.

(9) Remove pins; stop any open joints and mitres; apply finishing coat of distemper; second coat the panel border, if necessary, and remove splashes from floor and woodwork.

(10) Woodwork: Stop all holes and cracks with white-lead putty; apply first coat of zinc white, thinned with two parts turpentine to one part of oil.

Equipment required: Dusting brush, putty knife, putty, white lead, white paint, and paint brushes 2 inches and 1 inch in width.

(11) Rub down with wet glass-paper (No. 1 or No. 0 grade); dry off with wash-leather, clean windows, and apply two coats of paint (ivory tint); give additional coating if old work is not obliterated.

(12) Grain in water-colour; add figuring in crayon.

(13) Varnish with pale maple varnish, one coat only.

Equipment required: Clean water, stale beer, raw umber and raw sienna, or burnt sienna and black, varnish, light brown crayon, sponge, wash-leather, clean paint brush (for applying stain), mottler, badger-hair softener, varnish brushes (1 inch and 2 inch), and elastic varnish for window-frame.

(14) Walls: shade, trim selvedges, cut into lengths, paste and hang wallpaper (dominating colour—primrose); apply a 7-inch stiling border against picture-rail and skirting, and add vertical strips to form panels: remove material and equipment, and clean floor.

Equipment required: Scissors, 2-foot rule, plumb-line, paste brush, papering brush, seam roller, lead pencil, paste, wallpaper, and stiling border.

Remarks

Regarding item No. (6), the angle bead to skirting should be mitred carefully to fit accurately into corners. If the bead is less than $\frac{5}{8}$ inch in width, nail-holes should be drilled as a safeguard against splitting the timber. Fill any cracks between bead and skirting with putty.

(7) Distemper the centre panel first, then the surrounding frieze and its adjoining strip of ceiling. If this is commenced at an angle opposite the window and continued from right to left round the room, the point of joining will not be noticeable. Finally, coat the border with a fitch or other small brush.

Now for a few hints concerning ceiling work: See that step-ladders are kept fully open, and that ropes are in good condition. Scaffold boards or planks of less than $1\frac{1}{2}$ inches thick should be used double—*i.e.*, one upon the other. Twisted planks and wobbly step-ladders must be wedged and made firm. An open step-ladder is safer than one leaning against a wall: the latter must be fairly upright if used to support a plank. Try to avoid traps—*i.e.*, ends of planks, projecting beyond the steps. It is unwise to stride across a bucket whilst working on a plank; the safer course is to move the bucket.

Splashing can be controlled by observing the following points: (*a*) Apply distemper with a dry brush; (*b*) do not stand a brush in the colour; (*c*) dip the tip of the brush to a depth of 2 inches into the distemper, and dab gently against the side of the bucket to remove surplus; (*d*) avoid slapping the ceiling during application; (*e*) scrape the bristles on the rim of the bucket to prevent distemper working down to the roots (metal binding), meanwhile, keep the handle and one edge of the bucket clean and dry. To use a brush directly overhead is most

uncomfortable and not nearly so clean as working to the right or left.

(10) When stopping, fill up all cracks between window-frames and panes.

(11) Employ paint left over from the first coat and broken with a touch of yellow ochre. Keep one edge of the paint kettle dry and clean, and, when brushes are laid across the top, see that the handles are resting upon the dry edge. By observing this point, the hands and brush handles remain clean.

Bedroom (No. 3) (Fig. 97)

Assuming that the ceiling and walls are distempered, and the woodwork is painted cream. It is proposed to paper the ceiling with very pale green material, dotted with silver stars. The walls are to be distempered in Eau-de-nil, and decorated with a powdering of small, stencilled patterns based on floral or other natural forms. All woodwork is to be undercoated, and finished in pale mauve gloss paint. Re-decoration is carried out as follows:

(1) Ceiling and walls: wash off as much as possible of the old distemper; repair defective plaster, and glass-paper all rough places.

(2) Woodwork: rub down with pumice block and waterproof glass-paper; rinse and dry off.

(3) Ceiling: mark out guide-lines 6 inches from each wall to form one large ceiling panel. Strengthen these with lead pencil (not copying-ink), then proceed to mark out a frieze 2 feet 6 inches in depth.

(4) Size the ceiling panel, and distemper the surround and frieze to match the ceiling paper.

Material required: White oil-bound distemper, tinted with lime green or Eau-de-nil; ¼ lb. of concentrated size.

(5) Paper the ceiling panel, and then apply a final coat of distemper to adjoining margin and frieze.

(6) Apply narrow border to edges of ceiling panel.

(7) Woodwork: stop with white-lead putty, and apply pale mauve undercoat (zinc white, tinted with ultra-marine blue and crimson lake) thinned with two parts of turpentine to one part of linseed oil.

(8) Walls: touch up all plaster repairs, and, when dry, apply two coats of Eau-de-nil oil-bound distemper, keeping to a straight-edge at frieze level and those parts adjoining woodwork.

(9) Design, cut, and apply stencilled border and simple floral pattern to walls, using pale green, primrose, and pale mauve.

(10) Remove all material, equipment, etc., clean windows and floor and, when dry, give one coat of gloss paint (pale mauve) to woodwork. The latter may be obtained ready mixed, or prepared by tinting gloss white as for the undercoat.

Remarks

Item No. (4): when sizing the ceiling panel, keep within the pencil line, but when distempering the surround, it is advisable to extend just over the line—the latter will not be obscured.

(5) The lengths of ceiling paper are trimmed so that each end finishes just short of the guide-line. On no account should paste be allowed to dry upon the distempered margin. This can easily be avoided by keeping the ends folded (about 1½ inches) until the surplus is trimmed off, then, to make sure, wipe the adjacent margin with a damp sponge. To neglect this precautionary measure may result in flaking or peeling of the distemper.

(6) The foregoing remarks are also applicable when hanging the border. The guide-line, which is faintly discernible through two coats of distemper, enables the work to proceed with ease, speed, and cleanliness, except perhaps at the angles which require careful treatment and accurate mitres.

(8) Since the neatness and accuracy of surrounding edges are of first importance, these should be painted with a flat fitch (one wall at a time) before filling in the main area with a large brush. At the junction of walls and frieze the wall colour is painted to give a straight finish running parallel with, but $\frac{1}{8}$ inch below the guide-line. Any slight irregularity is subsequently covered by the stencil border.

(9) In stencilling, the border is applied first, commencing at one side of the window and continuing round the room. Make sure that the top edge coincides with the guide-line.

The powdering of walls must obviously be carried out in an orderly manner—*i.e.*, on a geometrical basis, and with due regard to scale. This can be planned by making a chalk mark at the centre of each wall and using a plumb-line to mark the centres of the pattern units which are centred (vertically) along this line at equidistant points—avoiding half-patterns at top and bottom. Decide the spacing of other vertical rows, and, with plumb-line, chalk, and rule, mark the centre of each unit, repeating this operation until all walls are "set out" and ready for stencilling.

Stencilling may be carried out in flat oil paint, or oil-bound distemper, as convenient, but the colours employed should be of similar tone to the background. Excessive contrast tends to produce a spotty effect which is anything but restful. Use a large palette board and a separate brush for each tint, always moistening the brush with

colour picked up from the palette, but never dipping into the paint kettle from which the palette board is fed. Observe the technique previously described (see p. 209).

Nursery (Fig. 98)

Assumed that the room is now distempered, and woodwork painted, and that we propose to carry out the following scheme: Ceiling and walls to be painted; ceiling, pastel blue; wall filling, banana; dado, turquoise blue, with parts left dull, in readiness for drawing upon with chalk or crayon. A deep border, decorated with subjects beloved by children, is to separate the dado and wall filling, and the woodwork is to be painted coral red, gloss finish. Re-decoration is carried out as follows:

(1) Ceiling and walls: wash down, stop, glass-paper, and touch-up repairs with thin paint.

(2) Woodwork: rub down, rinse, and dry off.

(3) Apply priming coat (tinted cream) of oil paint to ceiling and walls. Paint to be thinned with three parts of oil to one part of turpentine.

(4) Stop small holes and cracks with putty; measure and mark out guide-line at top of dado; apply second coat of cream to ceiling and wall fitting, using two parts of oil to one part of turpentine.

(5) Apply finishing coat of flat-paint (pastel blue tint) to ceiling.

(6) Give second coat (turquoise blue) to dado.

(7) Stop, and apply coral undercoating to woodwork.

(8) Apply egg-shell gloss paint to wall filling and dado.

(9) Prepare and apply the stencilled border, adding further detail with a sable pencil.

(10) Varnish the dado, leaving one rectangular space on each main wall unvarnished. When dry, take about

½ lb. of the undercoat, add 2 per cent. of powdered pumice stone and paint the rectangular areas, keeping the paint well stirred to prevent the grit from settling.

(11) Remove equipment; clean the floor, and then complete the painting of woodwork and furniture.

Remarks

Since this is the children's playroom, we have made full use of bright, contrasting colours, calculated to delight the average child. These should incline towards paleness —never in the reverse direction. All surfaces are washable, and therefore hygienic. For lists of pigments employed, see p. 274.

Should any difficulty be experienced in the decorative treatment of the border, there are several alternatives from which to choose: (*a*) Wallpaper borders featuring nursery rhyme subjects; (*b*) pictures from children's books may be cut out and pasted at regular intervals along the border; (*c*) the latter can be traced (by rubbing white chalk over the back of each picture) directly upon the wall and then painted in oil colour, or (*d*) the selected plates may be cut to form stencils which, after application, are outlined and finished by hand painting. Details such as birds, butterflies, stars, etc., might also be used as ceiling decorations.

Bathroom No. 2 (Fig. 99)

Let us suppose that the ceiling is painted, the walls papered and varnished, and the woodwork enamelled. There are hot-water pipes, a radiator, and the bath requires re-enamelling. The proposed scheme is covered by the following specification:

(1) Ceiling and walls: wash and rub down with sugar soap and No. 1½ waterproof glass-paper; rinse

and dry off. Repair defective plaster; glass-paper, and touch-up with thin paint.

(2) Rub down all wallpaper joints to produce a smooth level surface. This is accomplished by the use of a dry abrasive—No. 2½ glass-paper. Clear away the dust, and paste back any loose edges of wallpaper.

(3) Wash and rub down the woodwork and bath, using "Strippabloc" and pumice stone; rinse and dry off.

(4) Scrape hot-water pipes and radiator to remove rust.

(5) Apply two or three coats of broken white paint to ceiling and walls. The ceiling to be finished flat, and the walls in semi-gloss—*i.e.*, thinned with two parts turpentine to one part of oil.

(6) Coat hot-water pipes with aluminium paint, and then with two coats of broken white, mixed with Japan gold-size and turpentine.

(7) Woodwork; stop and undercoat.

(8) Prepare a semi-transparent wash of pale green oil paint, using three parts of turpentine to two parts of oil for thinning. Coat the walls, rag-rolling each in turn before commencing to paint adjacent walls. Use a gold-size and turpentine mixture for the treatment of hot-water pipes.

(9) Varnish the walls with pale carriage varnish.

(10) When the varnish is dry, complete the woodwork in opaline green, gloss enamel paint.

(11) Fix an empty jam jar under each of the bath taps (to catch drips); touch-up the inevitable bare places with white lead thinned with three parts turpentine to one part of carriage varnish, and repeat on the following day. Then apply two coats to the whole surface, and finish with a good bath enamel.

Remarks

Regarding operation No. (5), and others specifying proportions of thinners, it must be understood that driers must always be added in correct proportion to the oil.

(8) The rag-rolling of large areas is carried out by the following method: Soak an old (clean) wash-leather in a bucket containing a little white spirit; wring this out as dry as possible and fold to form a pad of about 5 inches in width. This must be twisted and the shape retained whilst the pad is rolled firmly from top to bottom over the wet paint. The leather is cleaned in white spirit after each strip is rolled. Care should be taken to preserve an even colour, and each strip should overlap very slightly upon the preceding one. If desired, each completed wall can also be rolled horizontally to produce a more compact pattern.

(9) It is always advisable to wipe down with a damp wash-leather before varnishing. This removes surface dust and helps to prevent cissing (see p. 140). Walls are varnished in a series of vertical strips, working from top to bottom as in painting. Commence at the top right-hand corner of one of the smaller areas and, until the brushing and setting properties have been ascertained, keep the various strips about ½ yard in width: cross and lay off vertically. Hot-water pipes require a varnish capable of resisting heat, and for these items we suggest Japanners' varnish, or one of the synthetic, heat-resisting varnishes such as "Valspar".

(11) Although bath enamel is usually white, it can, if desired, be tinted with a little dry pigment, well mixed (on a palette board) with turpentine. The undercoats should be coloured to match. There is also an alternative finish which, because of its easy brushing nature, should

appeal to the beginner. The bath is painted in the usual manner and then coated with a special bath varnish. This type of varnish is quite durable, but shares the disadvantage common to all varnishes—it cannot produce a white surface.

Whatever the finish employed, success will depend upon the observance of four main conditions, (*a*) dryness, (*b*) cleanliness, (*c*) hardness, and (*d*) smoothness of surface.

(*a*) and (*b*) On no account must the surface be damp or greasy, for either condition interferes with proper adhesion and drying of the paint.

(*c*) Each coat of paint must be allowed twenty-four hours in which to harden, after which time the work may be carried forward to the next stage.

(*d*) The smooth surface produced by preliminary rubbing down can be maintained by (1) glass-papering after the second coat, (2) using paint of the right consistency, *i.e.*, thinned until the material works easily under the brush and leaves no brush-marks, and (3) by applying each coat as quickly as possible, and not allowing edges to set before joining up the sections which follow. The latter is controlled by commencing work at the end containing the taps, and working towards the opposite end in a series of ½-yard strips which embrace the whole of the interior surface (Fig. 100).

The gloss finish is not applied until the undercoating presents a perfectly even colour. The varnish (or enamel) must be distributed as evenly as possible, each section being crossed and laid off in a horizontal direction before continuing with the next.

It is important that the finished job be allowed five days in which to harden before use. Then the bath is filled with cold water, which, in about two hours, completes the hardening and takes away the smell of paint. Drain off until required for use, then add cold water first

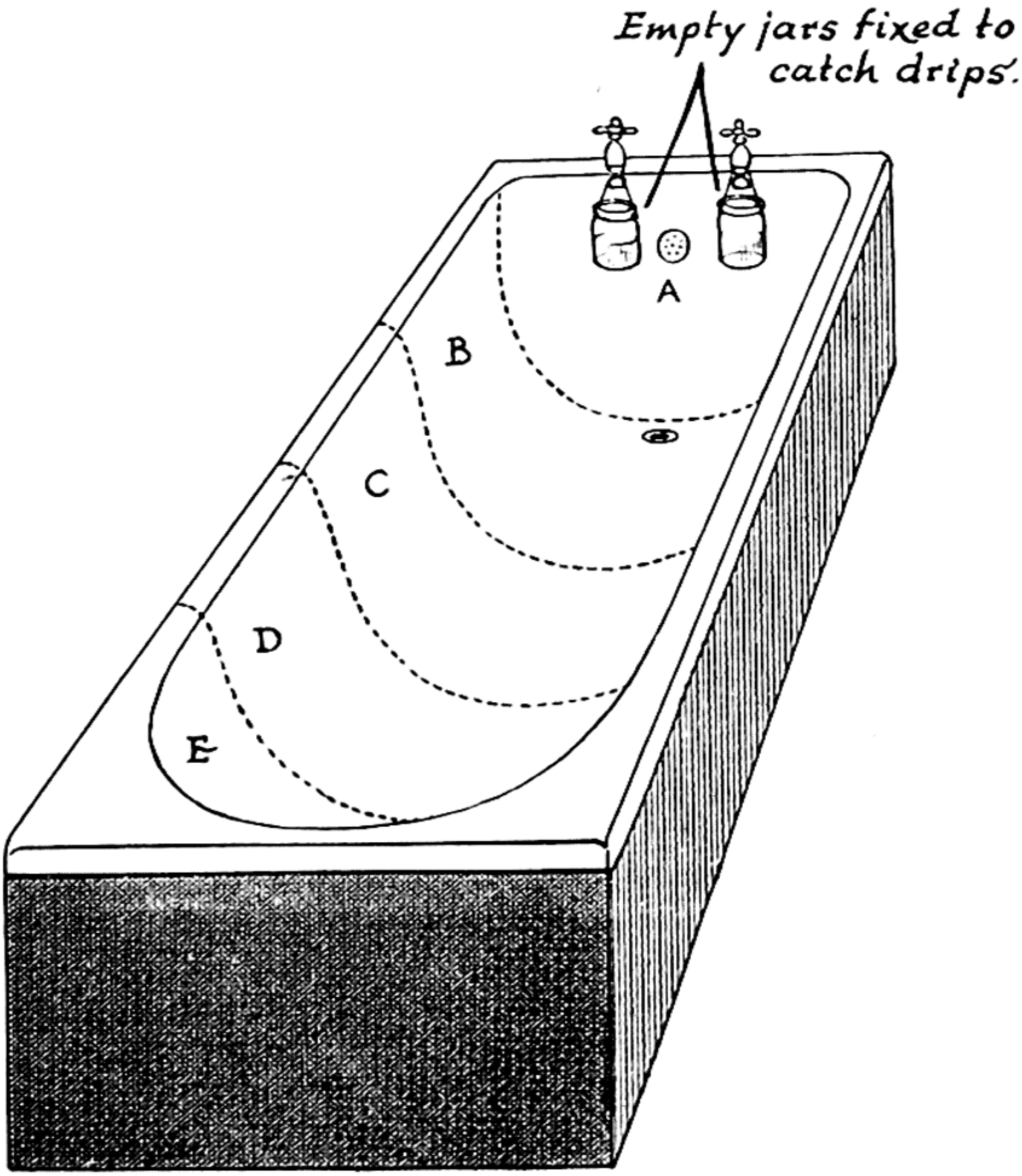


Fig. 100

A bath is painted in a series of strips, (A), (B) (C), etc. in the order illustrated.

and hot water afterwards. If this procedure is followed there will be little risk of the enamel being softened by excessively hot water.

Hall and Staircase (No. 1) (Fig. 101)

Assumed that the ceilings and walls are finished in oil-bound distemper, and the ceilings are flaking badly. The woodwork is in fair condition except for one or two door stiles which are badly scratched and furrowed.

We propose to re-decorate in colours which are equally suitable for almost any type of staircase, the general tone being pale, warm in effect, and possessing sufficient contrast to make the scheme interesting and bright. This is one section of a house which might well be gay and colourful, since little time is spent therein, and the lighting is seldom equal to that of living-rooms.

The following specification embraces the operations necessary:

(1) Ceiling and walls: wash down, scrape off as much of the flaking distemper as possible, stop, glass-paper rough places, and touch-up repairs with size.

(2) Woodwork: wash and rub down with pumice block, rinse, and dry off.

(3) Ceilings: coat with egg-shell flat oil paint to bind down remaining distemper and, when dry, level the hollow places with Alabastine filler, glass-paper, and touch-up with the same paint.

(4) Decorate all ceilings, including cornice and frieze —if any—with two coats of egg-shell flat paint, tinted cream.

(5) Woodwork: apply the first coat of paint (ivory tint); then, when dry, level the hollow and furrowed areas with Alabastine filler, glass-paper, and touch-up with thin paint.

(6) Doors: apply additional coats of paint until the old surface is obscured.

(7) Remaining woodwork (excepting stair treads and risers), to be painted one coat of silver-grey undercoating, followed, when dry, with gloss paint or varnish.

(8) Walls: hang with wallpaper, the general hue of which is Portland stone, decorated with wavy lines in terra cotta, pale fawn, and pale cream.

(9) Doors: brush-grain with raw umber in oil to give a pale, bleached oak effect. Figure each door immediately after brush-graining.

(10) Clean all floors; varnish doors with pale maple varnish, and complete stair treads.

Remarks

Item No. (3). Alabastine filler, or, alternatively, a mixture containing equal parts of oil-bound distemper and plaster of paris, should be mixed to a creamy paste with water, and applied with a broad scraper or filling knife with a flexible blade.

(4) Since the conditions responsible for the initial flaking may still prevail, it is safer to line the ceilings before continuing to decorate with paint or distemper. Alternatively, a self-coloured lining or ceiling paper can be hung directly upon the prepared surface.

(5) Before commencing to paint door casings, skirtings, and stairs sides, see that all cracks between woodwork and walls are stopped with plaster and glass-papered smooth.

(7) Treads and risers should, for obvious reasons, be left until ladder-work has been completed, but balusters and stairs sides adjoining walls are to be undercoated. Since the walls are to be papered it is advisable to paint about $\frac{1}{4}$ inch of those edges adjacent to walls.

(8) The main problem associated with the decoration

of staircase walls is that of reaching the more inaccessible parts. This is usually achieved by means of a scaffold built up with the aid of a small extension ladder, step-ladder, and one or two handy planks (see Fig. 102), which enables the ceiling and walls to be dealt with in safety.

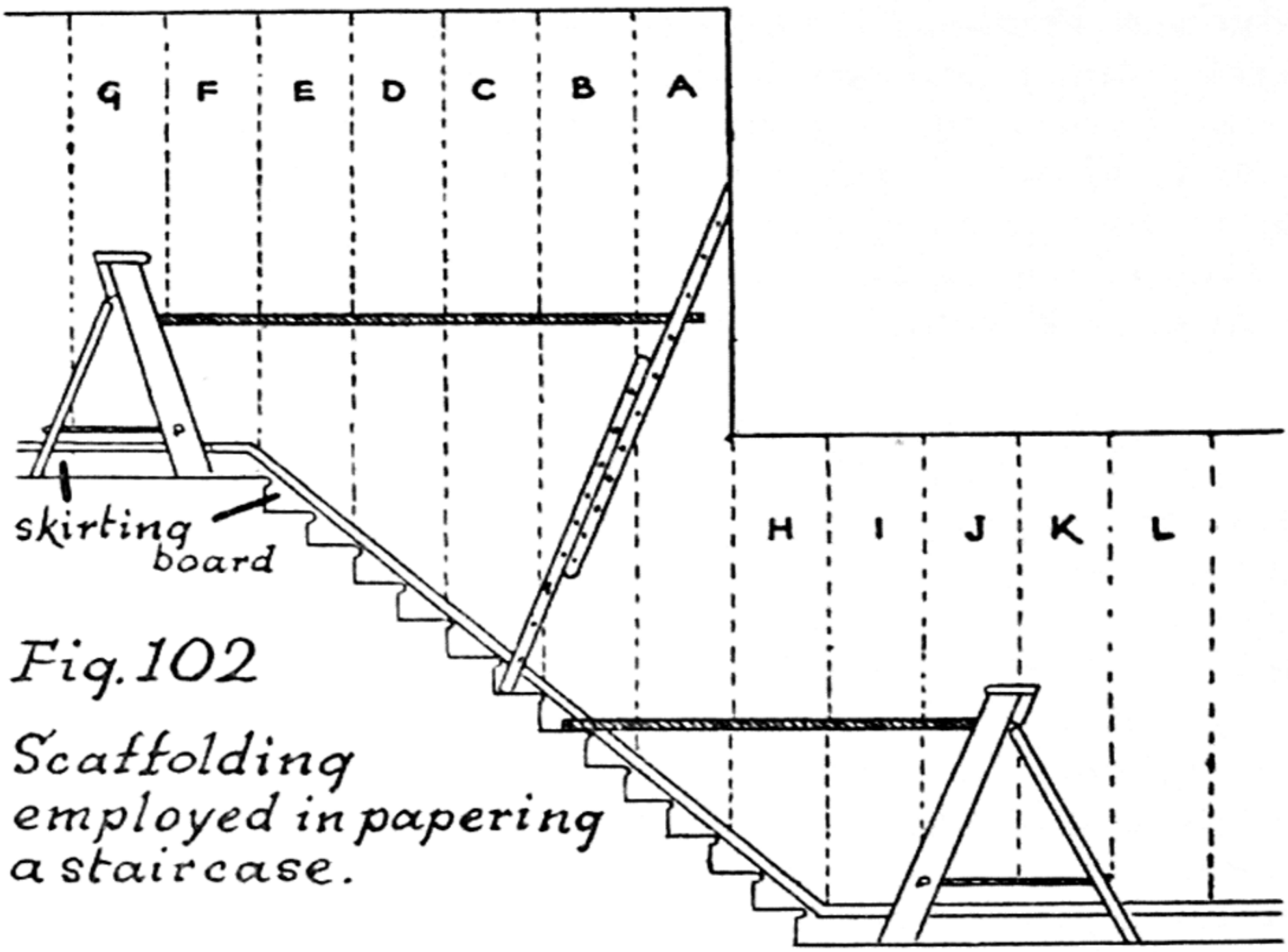


Fig. 102

Scaffolding employed in papering a staircase.

The papering of staircase walls must be planned so that the longest and most awkward lengths are applied first, and in the order A, B, C, etc., illustrated. The lengths are measured carefully, and the angle of the slope allowed for when trimming off some of the surplus paper. Cut and paste these long lengths one at a time, folding as shown in Fig. 103.

It is advisable to have some one stationed below the ladder to support the weight of paper as the folds are

released prior to hanging. Apply the first length to a perpendicular guide-line and test with a plumb-line before the final trimming of the ends. If the hall and staircase wall forms one large flank, continue to hang lengths H, I, J, etc., right up to the nearest door casing.

The lengths X, Y, and Z (see plan illustrated at Fig. 104) must not be applied until the first one (A) is quite dry. This is reached from a pair of steps (S1) the feet of which project through the baluster rails and

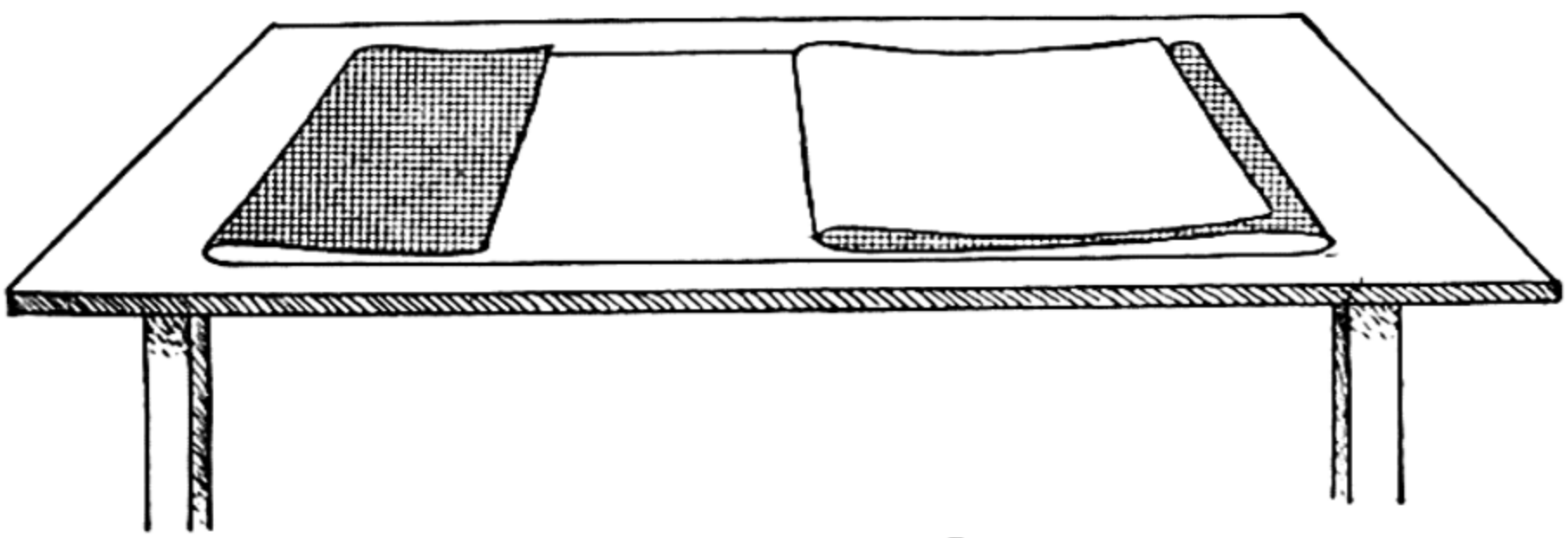


Fig. 103
A length of wallpaper ready for application to the wall of a staircase

rest upon the landing-floor. Tie the bottom rung to the balusters and place a pad of clean cloth between the top of the ladder and the wall. A short plank (P) may be found necessary, and in this event may be supported by two pairs of steps (S1 and S2).

Another type of staircase is illustrated—in plan—in Fig. 105. Here, the lengths A1, B1, C1, and D1 are applied and, if the paper is plain, we follow with A2, B2, C2, and D2, before hanging length X. When X is quite dry the ladder head is padded and allowed to rest upon this part whilst length Y is applied.

For patterned papers we hang A1, B1, C1, etc., then

length Y (Fig. 105) and allow this to dry before continuing with X, A2, B2, C2, etc., in the order mentioned.

(9) Although the colour specified is much paler than the usual light oak, the effect is most decorative and attractive. The stain must be used in the form of a thin wash with just sufficient contrast to show the marks left by

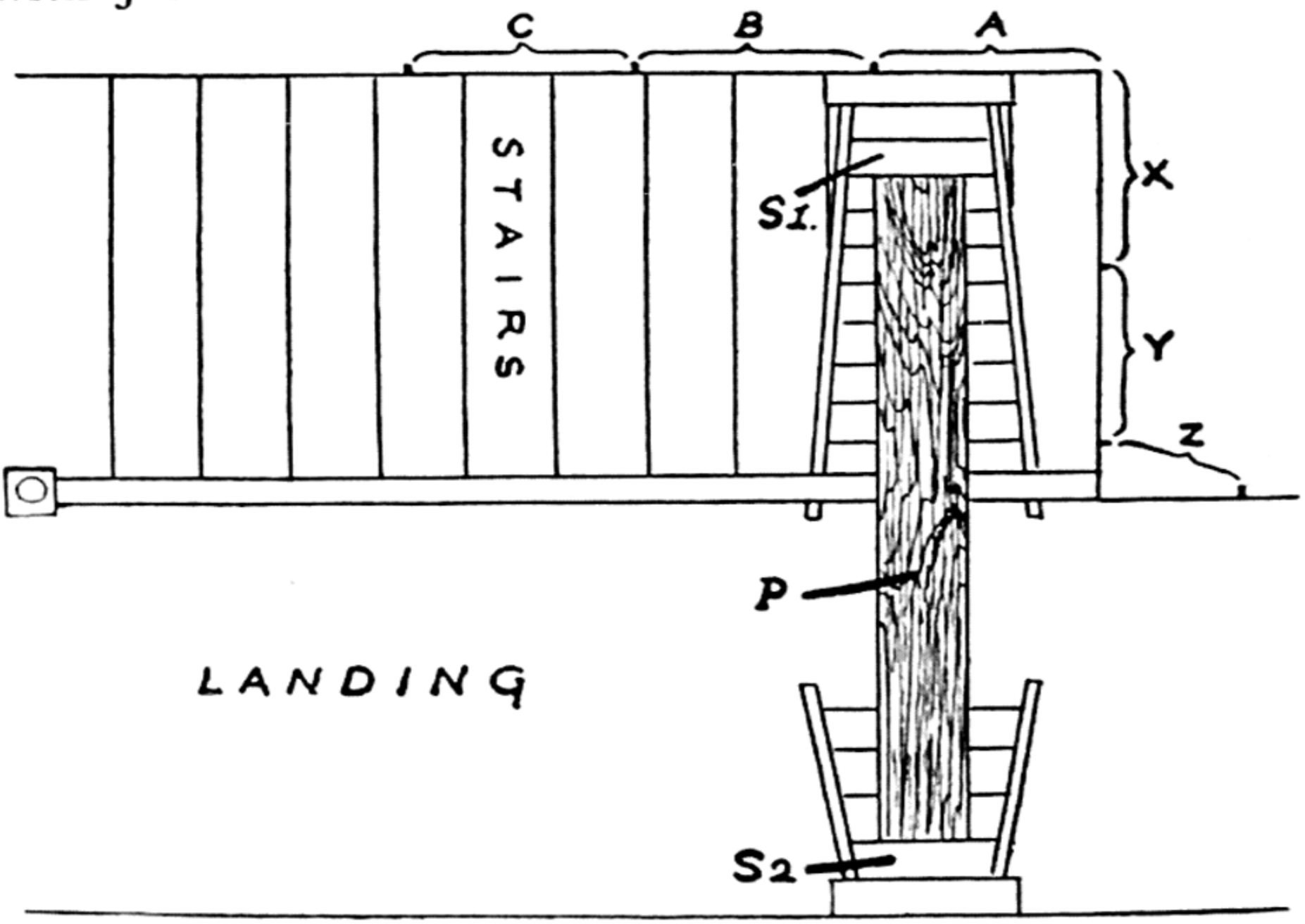


Fig. 104 Plan of staircase

brush-graining. The colour should be rather like a greyish-cream, and certainly no darker.

This is figured with the same stain, painted on with a sable pencil to suggest the grain of quartered oak (see quartered oak; Chapter VI). When dry, the work can be rolled with a check roller (Fig. 87), using a very dilute wash of ivory paint to suggest pores. This produces a limed-oak effect which is mellowed and softened by the coating of gloss varnish which follows (Fig. 106).

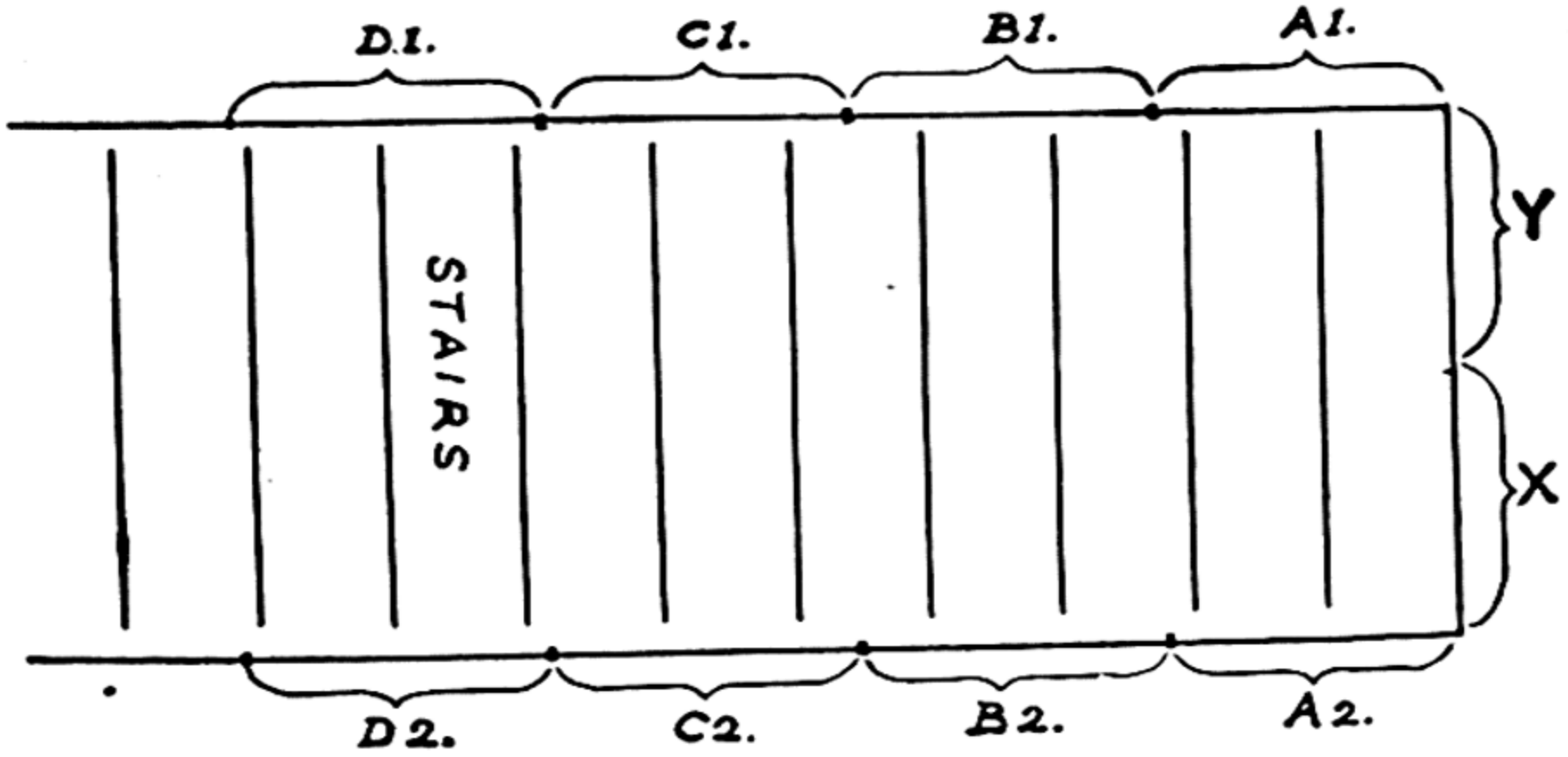


Fig. 105

Plan of staircase.



Fig. 106

Limed Oak

If desired, the work can be taken a stage farther by the application of one coat of flat, or egg-shell flat varnish, over the coating of gloss varnish.

The Lounge (No. 1) (Fig. 107)

We propose to re-decorate a room, the ceiling and walls of which are papered, and the woodwork painted. The ceiling is to be decorated with an elliptical border of skived ornament (Anaglypta), and finished in flat-paint; the walls are to be painted and panelled, and the woodwork finished in flat enamel, with mouldings picked out in gold leaf. The transformation is accomplished in the following order:

(1) Apply several coatings of hot water to all papered surfaces. When saturated, scrape off the old paper and wash off every trace of paste and size from the plaster surfaces beneath. Repair defective plaster, and glass-paper to remove any surface roughness.

(2) Wash and rub down the woodwork.

(3) Prime the ceiling and walls with the palest colour (parchment), thinned with three parts oil to one part of turpentine.

(4) Set out the ceiling ellipse in white chalk, and fix the skived ornament.

(5) Paint the ceiling in pale flesh pink, and the walls parchment, using three parts oil to two parts of turpentine for thinning purposes.

(6) Stop, and undercoat the woodwork with salmon pink.

(7) Paint the ceiling and walls, stippling the ceiling only, and using flat oil paint throughout.

(8) Set out the wall panels with white chalk, string, and plumb-line; leaving surrounding borders about

6 inches in width. Arrange to have one large centre panel and two small panels on each of the main walls.

(9) Paint the wall panels with salmon colour, stippling each in turn with a coarse rubber stippler to produce variation in colour and texture. Use a mask for the protection of surrounding borders when stippling edges of panels.

(10) Repeat the painting of woodwork with salmon colour, egg-shell gloss paint.

(11) Stencil double lines around wall panels, using coral pink, semi-gloss paint.

(12) Complete the woodwork with flat enamel tinted slightly deeper than the undercoat.

(13) Allow one week for hardening, then complete the door by gilding one prominent member of each panel moulding.

Remarks

Item No. (4): Sketch a true rectangle of the required length and width, draw interlacing lines as illustrated (Fig. 108) and, with these as guide-lines, sketch the elliptical shape, freehand.

Anaglypta skived ornament is available in a wide range of patterns, but for our immediate purpose the "Adams" style, with its flexible strings of husks, combines grace and elegance appropriate to the room in question. Anyone unaccustomed to this class of relief material might think it well-nigh impossible to hang, since the edges to be pasted are seldom more than $\frac{1}{10}$ inch in width.

The edges should be coated with dextrine paste—applied with a knife—and put aside for half an hour, or until tacky. Fix each length in the position required and hold secure by knocking a pin-point into the edge of each husk. The point should not be driven deeply into

the plaster, otherwise its removal on the following day may be difficult.

(13) A gilding job of this nature should not cost more than three or four shillings for material and, if one of the projecting mouldings happens to present a flat face, the work is very simple.

The materials required are: Japan gold-size tinted

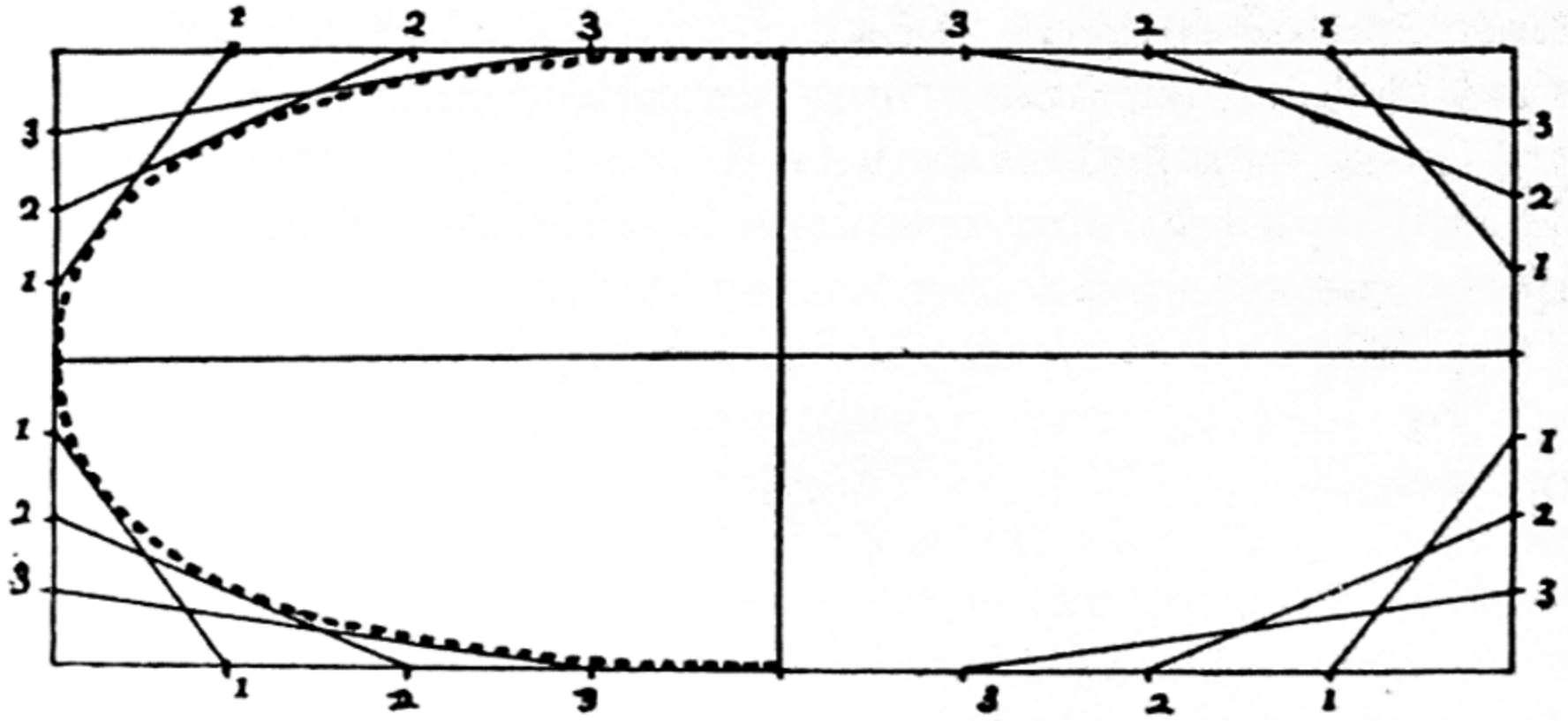


Fig. 108
A simple method for the construction of elliptical forms. The curve is sketched freehand.

with yellow chrome; dry whiting, or french chalk; genuine 23-carat English gold leaf (transfer); cotton wool, and a large sable pencil.

Whiting (or french chalk) is placed in a muslin bag and stippled upon the mouldings to be gilded. The moulding is then painted with coloured gold-size, taking care to keep both edges straight and true and to apply a coating of even thickness. The size should be ready for gilding within one hour of application—a state which is ascertained by touching lightly with the finger-tip. When the finger leaves no impression upon the size,

gilding should be completed without delay, otherwise the size hardens rapidly and the gold will not adhere.

Transfer gold leaf is always employed upon flat surfaces (except glass). It is obtainable in books of twenty-five leaves, each 3¼ inches square and attached to a sheet of tissue paper. In this form the gold can be handled with ease, and waste is reduced to the minimum. The metal is placed directly upon the gold-size and the paper backing is rubbed gently with the ball of the thumb. Adhesion is instantaneous, and the gold should leave the paper quite clean; if not, apply a little pressure to any parts still attached to the paper; the warmth of the thumb will assist proper adhesion.

On the day following, the gold is lightly polished with a wad of cotton wool. This removes all ragged edges and most of the surplus chalk; the remainder being wiped off with a damp wash-leather. Gold retains its lustre for some years and, if used with restraint, imparts considerable richness to a scheme.

The Dining-Room (No. 2) (Fig. 109)

The room is of medium size, with ceiling, cornice, and frieze distempered, walls papered, and the woodwork painted. There is an oak mantelpiece and plaque shelf, both of medium tone, and the window is fairly large. Because this is one of the most important rooms in the house we propose to carry out the following scheme, which is calculated to reduce the time required in future re-decoration.

(1) Ceiling, cornice, and frieze: wash off all old distemper; stop, and glass-paper where necessary.

(2) Walls: these are soiled, but in good condition. The paper is semi-plain, with neat butt joints which appear quite sound and firmly attached. Apparently, it

should be possible to re-decorate with oil-bound distemper, so we apply one coat of weak jellied size and keep a sharp look-out for loose patches which, if general, indicate the unsuitability of such treatment. In the latter case the old paper must be stripped off.

(3) Woodwork: wash, rub down with pumice block, rinse, and dry off.

(4) Prime the ceiling, cornice, and frieze with cream paint; apply old gold distemper to walls, and first coat of buff paint to woodwork.

(5) Apply second and third coats to ceiling and frieze; finishing coat to walls, and second coat to woodwork.

(6) Grain woodwork to match mantelpiece (see p. 237), then, when dry, apply one coat of undercoating varnish.

(7) On the day following, rub down (wet) with No. oo waterproof glass-paper, taking care not to scratch or disfigure the graining. Dry off with a wash-leather and varnish with egg-shell gloss varnish.

(9) Paste and apply a 1-inch, imitation leather border, to walls adjoining plaque shelf and skirting, and, if desired, employ the same material at equidistant points to form a number of vertical panels.

Remarks

Item No. (5). A narrow cornice might well be grained and flat varnished to match the woodwork.

(6) An undercoat of gloss varnish is particularly necessary to withstand the wear and tear, washing down, and future renovation of the work.

(9) Leatherette borders are usually embossed and decorated with button-like shapes in dull bronze. These must be pasted and allowed to soak until pliable before hanging. Since it is obviously impracticable to cut and paste single strips of border, these should be dealt with

in mass—*e.g.*, four or five widths, not exceeding 12 feet in length, are pasted, folded for cutting, allowed to soak, and whilst still folded, are cut into single strips ready for immediate application.

The Kitchen (No. 1) (Fig. 110)

Assumed that the walls are now finished in gloss paint of a rather dark tone. The areas adjoining a gas cooker show traces of grease and the paintwork of one door is badly blistered. The kitchen is used for washing as well as cooking and, being none too spacious, is particularly liable to condensation.

We propose to introduce bright, cheerful hues, pale in tone, with the object of increasing the apparent space and imparting a healthy atmosphere. The ceiling and walls are to be finished in flat oil paint to reduce condensation.

The re-painting of food cupboards is always a problem. These must obviously be emptied, and the interior cleaned and painted without delay. Water paint (oil-bound distemper) is probably the best material for the job because this dries quickly, thus permitting the application of two coats in one day. Furthermore, the smell of this material is less objectionable, and disperses more rapidly than that of oil paint.

It may, of course, be possible to secure a satisfactory finish with one coat of flat oil paint, but for several days afterwards foodstuffs, such as butter, bread, and milk, should be stored in another room—other goods are rarely affected by paint fumes.

As a general rule it is better to leave the tops of shelves unpainted, for the hardest of oil paints remain slightly soft for a week or so after application, and in this state are too easily marked. The idea of tiling at least one of the shelves is worthy of consideration. These can be

fixed with any type of waterproof glue, or with gold-size, the tiles being held more securely by a surrounding strip of quarter-round timber. Finally, the joints are filled with Keene's cement, mixed to a batter-like consistency, and rubbed in with a piece of rag.

Once the cupboards are finished and goods stored away, there will be considerably less inconvenience and disorganisation in this very important centre. Remaining surfaces can be treated in the following manner:

(1) Ceiling: wash with sugar soap solution, rinse, and dry off.

(2) Walls and woodwork: apply the same treatment and rub down with "Strippabloc"; rinse, and dry off. Give special attention to the complete removal of grease, using a scraper and scrubbing brush for the purpose. The worst parts can be coated with limewash, which neutralises any remaining grease. After an interval of several hours the lime is washed off with clean water.

(3) Repair defective plaster.

(4) Strip off the blistered paintwork, using a blow-lamp or spirit solvent (paint remover), as convenient; glass-paper the surface in readiness for knotting and priming.

(5) Glass-paper all plaster repairs and touch-up with oil paint tinted to match surrounding colour.

(6) Knot and prime the door.

(7) Stop all nail-holes, cracks, etc., in woodwork, using four parts of putty to one part of white lead.

(8) Apply one coat of flat-paint (pale primrose) to ceiling, and pale lemon to walls. Woodwork should receive an undercoat of white-lead paint, thinned with two parts turpentine to one part of oil, and tinted to match the walls.

(9) Complete the ceiling and walls.

(10) Apply one coat of gloss paint (lemon yellow) to woodwork, leaving mouldings untouched.

(11) When dry, paint all mouldings, using gloss paint (canary) and a part worn flat fitch.

Remarks

Item No. (9). Although we specify two coats of paint upon ceiling and walls, it may be possible to complete the ceiling at one operation. On the other hand, the walls may require an extra coat to obliterate the old surface satisfactorily. Much depends upon the amount of preliminary stopping or plastering, and the obliterating capacity of the paint employed. It should, however, be realised that oil paint becomes slightly transparent within a few months of application, and because of this fact an extra coat of paint will usually prolong the effective life of the work.

(11) In this scheme we rely upon the coral-red curtains and russet floor covering to supply contrast. Where this is impracticable, full use may be made of mouldings, door casings, the moulded top edges of skirtings, etc., all of which may be painted with russet, coral red, black, blue, or turquoise green, to relieve and break up the large areas of pale colour.

CHAPTER IX

CLEANING AND RENOVATING

Washing and varnishing.—The cleaning of various surfaces—painted, varnished, french polished, papered, and distempered; stonework; old paint brushes.—Sizing and varnishing a wallpaper.—Preservation of galvanised water-tanks.

Washing and Varnishing

The washing and varnishing of grained work should be regarded as a necessary routine measure to be carried out every two years (for outdoor surfaces), or after a period of five years in the case of interior work. This process is most economical, giving excellent results, and thus extending the life of grained work over a period of years.

The equipment necessary for washing down must include: (1) clean, cold water, clean rag or sponge, and a distemper brush; (2) hot, soapy water, and an old distemper brush or soft scrubbing brush. Soap powders, such as Rinso, Oxydol, Persil, or similar products, give excellent results, and so do the various sugar soaps. All must be used with care and at moderate strength, otherwise the paint may be stripped.

Sugar soap must be used in accordance with printed instructions on the packet, but other soaps should be added to 1 gallon of hot water in quantity sufficient to form soap suds—no more. Washing is always commenced at floor level and continued, by stages, upwards, the object being to prevent soapy water from running down a dry surface and thereby forming streaks of paler tone which cannot be removed.

A door, for example, is treated in the following manner: Wet the casing with clean water, then take the

soapy water and apply with a brush, commencing with the bottom cross-rail and working upwards to include the lower half of the door. This area is scrubbed until clean, taking care that no part is allowed to dry. Rinse with clean water and then proceed to wash the upper half, at the same time keeping the lower half wet with clean water. Finally, the whole is rinsed with cold water, keeping the door wet whilst the casing is treated. The whole is dried off with a wash-leather or clean rag.

Picture-rails, skirtings, etc., are dealt with in single lengths, taking care to wipe any splashes from adjacent paintwork. On completion, leave the floor clean and dry.

Varnishing should not be attempted for several hours —*i.e.*, before the surfaces are perfectly dry—otherwise a milky bloom will appear. Outside work may involve the preliminary filling of open cracks: a job necessitating the use of putty, stained with pigment in oil, to match the general colour of the graining.

Worn or damaged places are touched-up (after varnishing) with varnish tinted with umber or other appropriate oil colour (see " List of stains," p. 231). This is applied with a large pencil brush charged sparingly with colour and blended carefully into the wet varnish until the defects are adequately disguised. This method of touching-up can be applied to other broken-colour work such as rag-rolled surfaces, but is infinitely more difficult when attempted upon plain, self-coloured surfaces.

Cleaning Paintwork

Painted, varnished, or enamelled surfaces require great care lest the washing process results in the production of patchy work. Generally speaking, it is better to employ dilute soap solutions and as little scrubbing as possible, relying upon the solvent action of sugar soap to penetrate

evenly through dirt and dust, and permit its removal by rinsing with clean water. This process operates efficiently when paintwork is washed regularly.

Surfaces containing quirks, mouldings, etc., do not always respond to this method of washing, particularly when dirt has become ingrained in the recesses. This type of work requires a good scrub down, using hot water and ordinary soap, which has little effect upon gloss. To use powder soap is risky, since this is liable to damage the gloss of painted or varnished work. Similarly, the act of scrubbing has an abrasive action which dulls the paintwork, and if this is not carried out evenly, the surface will be patchy. Because of this action, it will be appreciated that a soft brush is preferable to a floor scrubber for the cleaning of paintwork generally. Whatever method is adopted, the work must conform to the foregoing instruction of working from the base upwards and keeping the surface wet until finally rinsed and wiped down with a chamois leather.

Gloss paints and varnishes should not be allowed to become grimy. Dirt eats into the surface (particularly on outdoor work) and injures the gloss, but this can be prevented by wiping down at regular intervals with a damp wash-leather.

French Polish

French-polished work can also be kept in good condition by the foregoing method, but in this instance the wash-leather is damped with warm water containing a little vinegar. It should be used in an almost dry condition.

Polished work is rarely washed with soap and water except as a preparation for re-polishing. Prolonged washing induces blooming (a milky appearance), roughens the surface, and is altogether undesirable.

An alternative method which cleans and polishes in one operation employs a mixture containing equal parts of refined linseed oil, methylated spirit, and vinegar. Shąke well and apply sparingly with a clean cloth, then, after a few minutes, polish with a soft duster. This polish reviver is very effective, is quite harmless, and —unlike wax polish—causes no complications when the work is again french polished.

Cedar-oil polishes are equally reliable. A few drops are sprinkled upon a damp cloth and rubbed over the surface to be cleaned, then, after a few minutes, the work is polished with a dry duster.

Distemper and Wallpaper

These surfaces are usually cleaned by one of two methods: (1) Dry cleaning, with (*a*) a clean duster wrapped over a soft broom; (*b*) a piece of stiff dough, prepared from flour and water in the usual manner; (*c*) stale bread, or (*d*) plastic rubber.

(2) Alternative methods involve the use of water, either clear or soapy, according to the surface treated. A wet method should always be preceded by a preliminary wipe down with a dry duster.

Washable distemper, as the name implies, can be sponged down with warm water, with or without a little vinegar. Alternatively, a little yellow soap (or soap flakes) may be added, but only in sufficient quantity to soften the water. The actual washing involves a certain amount of risk, especially when the surface contains rough patches, or presents unequal porosity. In such instances it is difficult to avoid a patchy finish, but there is no better alternative.

The best results are obtained by washing down with a piece of soft woollen material, such as a scrap from a white blanket. This—after immersion in water—is wrung out,

folded to form a flat pad, and rubbed lightly over the distemper until the area concerned is quite clean. This process is repeated, washing a number of small areas, and rinsing the swab at frequent intervals, until the work is completed. The job is completed in one operation, which dispenses with rinsing down.

Wallpapers are of two main types, those known as sanitaries being printed in washable colours, while the great majority are printed in size-distemper. Fortunately, the latter colours (apart from black) are so well fixed as to be almost washable. When considering the possibility of cleaning wallpaper, note whether any part is discoloured by dampness, for these areas are usually beyond repair. Providing that a wallpaper is free from violent contrast of tone it is often possible to renovate the surface by the wet method already described. It will, of course, be advisable to experiment on some out-of-the-way section of the work, before tackling the main areas concerned. The alternative is one of the dry methods previously mentioned.

Size-distemper is not easily cleaned. It is readily removed by water, which rules out the wet method except as a last resort. Usually, one of the dry methods is preferable, but in cases of failure the more drastic treatment is sometimes worth-while. It must, however, be carried out lightly and carefully.

Stonework may be cleaned by several methods: (*a*) by washing and rubbing down with clean water and a flat piece of stone of softer character—this is particularly effective upon smooth stonework; (*b*) by a similar method, but employing one of the tinted (cream) stones made specially for the purpose, or (*c*) by washing down with caustic soda solution.

(*a*) This method cleans and smoothes the surface, but is not effective on rough stonework; (*b*) is equally suit-

able for jambs, sills, and lintels of windows or doors, whether rough or smooth. The rubbing-stone leaves a coloured coating upon the work treated, and this deposit is spread evenly with a damp cloth. Neither (*a*) nor (*b*) is harmful to the stonework.

(*c*) Caustic soda is quite effective when other means have failed, but it should be remembered that this is extremely powerful and capable of burning the skin and the brush employed in its application. Furthermore, it is an efficient paint remover capable of disfiguring any paintwork which may inadvertently be splashed (see Chapter II, " Caustic Paint Removers "). Caustic solutions are applied with vegetable-fibre brushes, which are cheap and alkali resisting. After washing, the surface is rinsed with clean water.

(*Note.*—This process is more suitable for the removal of lichen and the general cleaning of crazy paving, flagstones, etc., rather than the cleaning of stonework adjoining door or window openings.)

Stonework may, of course, be treated with oil paint, or oil-bound distemper, either of which imparts a clean appearance, but it would appear that the painting of stonework—unless porous—is fundamentally wrong, so we leave this controversial point to the reader's discretion.

Paint Brushes

Since paint brushes are expensive and variable in quality, a good brush is worthy of proper attention, particularly by the amateur, who appears to lose brushes through lack of care rather than by normal usage. The following hints on the care and renovation of paint brushes should, if put into operation, reduce such losses to the absolute minimum.

(1) Never stand the brushes in paint, for this causes

an accumulation of pigment in the roots (base) and, if left overnight, may become partly dry.

(2) When not required for several hours—*i.e.*, at intervals between the application of several coats of paint—the bristles should be immersed in cold water. It is better to suspend the brush, thus keeping the weight off the tips of the bristles. Brush handles can be secured between the coils of a spiral spring which projects beyond the edges of the paint kettle and thereby suspends the brushes.

(3) Varnish brushes should be immersed in linseed oil; not water.

(4) When changing from light to dark colours, brushes may be cleaned by dabbing in a vessel containing white spirit (or paraffin).

(5) When changing over from dark to pale colours, and when a job is completed, brushes are rinsed in spirit and then washed in hot water and common soap—soda is not advisable because of its injurious effect upon bristle. The washing of brushes is never a popular job, but it should, nevertheless, be performed with care since any pigment allowed to remain in the roots is liable to harden or become fixed.

Some painters object to the preliminary rinse in white spirit on the grounds that subsequent washing with soap is rendered difficult. This is a debatable point because the cleaning of a brush depends upon (*a*) chemical, and (*b*) mechanical action, applied as follows:

(*a*) Soap and water are rubbed into the bristles with the object of converting the paint medium (linseed oil) into a soap, and until this is achieved, no amount of rinsing will remove the paint completely.

(*b*) Mechanical action is equally essential, for the mere act of rubbing the brush upon a bar of soap assists

the formation of lather and helps in the saponification of the oil. By alternating (*a*) and (*b*), and rinsing at frequent intervals, the brush is cleaned in a few minutes. The really awkward operation is that of removing pigment from the roots of a brush. This requires plenty of soap and water to produce a good lather, and a scratching action with the finger-tips. When clean, rinse thoroughly with cold water and allow to dry off in a natural manner—not by the application of heat.

Dry brushes should be stored in a tin box containing flake naphthalene, camphor, or other substance calculated to prevent damage by moth. If kept in a medium temperature they remain in excellent condition for many years.

A special cleaner is available for the rinsing or softening of brushes used in cellulose lacquer. Many of these solvents are equally effective for the reconditioning of neglected paint brushes which have been allowed to harden. Such brushes can generally be restored to a usable condition after standing for two or three days in a jar containing paint remover. The latter should be of a thin consistency and, to prevent loss by evaporation, the jar should remain covered with several layers of clean rag.

The brush should be examined at convenient intervals and dabbed against the base of the jar with the object of opening the mass of bristle. If this treatment proves ineffective the brush is taken out, placed on a solid base, and loosened by tapping the bristles with a hammer, after which it is returned to the jar for further soaking.

When soft, the brush is washed by dabbing in white spirit or paraffin, loose paint is scraped off with an old knife, and, if necessary, the outer bristles may be severed at the roots and removed. Complete the job by washing in hot water and soap.

Some solvents are extremely rapid in their action, in which case a brush may be completely restored in one day. On the other hand, in really stubborn cases the application of heat may succeed where other methods have failed. As a last resort the bristles may be immersed in almost boiling water containing 10 per cent. of vinegar; when soft, scrape well, and wash in soap and water as previously described.

Odd Jobs

Varnishing Wallpaper

In a papered bathroom or kitchen it is often desirable to varnish a portion of the wallpaper, thus forming a really washable surface. In the case of sanitary (washable) wallpapers this presents no difficulty. It is merely a question of protecting the paper with two coats of jellied size, after which a pale varnish can be applied successfully.

Ordinary wallpaper requires careful treatment lest the colours be smudged during the operation of sizing. To minimise this danger it is necessary to apply the first coat of size in a fluid state, using a soft brush, and taking care not to coat any portion more than once. In like manner, the second coat should be brushed over the surface with the lightest possible strokes, taking care that no parts are missed.

An alternative method involves the application of one coat of "Durocel" Invisible Varnish, a proprietary material supplied by Arthur Sanderson and Sons, Ltd. This imparts no gloss, but fixes the colours and makes the paper washable. It can, of course, be sized and varnished in the usual manner.

Hand-Rails

Varnished—as distinct from french polished—hand-rails can be renovated by the application of polish

reviver (see p. 309). Alternatively they may be washed with a hot solution of sugar soap, rinsed with clean water and, when dry, coated with a quick-drying varnish such as "Sigmarda" or Japan gold-size. Both are obtained from decorators' merchants. On no account must french polish be applied upon oil varnish, for such treatment is almost certain to result in cracking.

Obscuring Window-Panes

It is not generally realised that the gloss paints manufactured for outdoor use are equally suitable for the painting of interior (or exterior) glasswork. Because of their tenacious nature they adhere to the smooth impervious surface far better than flat oil paints, and are capable of resisting the effects of condensation for several years.

In the painting of window-panes it is essential that the glass is perfectly clean and dry; the presence of grease being particularly objectionable. The paint should be thinned with a little turpentine, and applied as evenly as possible, crossing and laying off as in varnishing. As each pane is completed, the surface is stippled with a soft brush until an even colour results.

Should it be necessary to obscure only one-half of the pane, it is advisable to paint a black line across the upper part. Black japan is extremely durable, and is ideal for borders of this type. When dry, the lower section is painted and stippled. The decorative possibilities are very wide. A pencil drawing can be pasted on the outside of a window, the main lines painted (on the inside) with black japan and, when dry, the intervening spaces may be coated with semi-transparent washes prepared from carriage varnish and pigments ground in oil. Each colour is stippled with a small brush, and the whole work is finally protected with a coat of varnish. The effect

resembles stained glass, and forms a suitable decoration for a hall or bathroom.

Water-Tanks

Midsummer is the ideal time for renovating galvanised water-tanks, inside and out. The first job is that of examining the outside for signs of corrosion. These take the form of blisters which indicate that corrosion is in an advanced state and, in the majority of cases, rust has penetrated from the inside. The danger of scraping such surfaces will be obvious, since the effective life of the tank is nearly over.

The painting of such work should prolong its life by several years, but the surfaces must be treated with great care lest the sides or base be holed during the preliminary cleaning operation. Tanks in good condition should be treated more vigorously, all rust being removed by scraping, and the dust carefully recovered and taken away.

Since the surface must be bone dry at the time of painting, the tank should be emptied and the inlet valve closed some two days before cleaning and priming. Both the inside and outside may then be coated with bituminous paint, specially prepared for this type of work. At least one variety is widely used for the treatment of water-tanks on ships. The manufacturer's instructions must always be observed when using proprietary goods.

Condensation

This occurs during the more humid periods, and at times can be very troublesome. The cold exterior of a large water-tank is particularly liable to induce the trouble, but fortunately there are special paints described as anti-condensation paints which are capable of insulating a cold impervious surface, thus effecting a satisfactory

cure. Such paints are often coarse in texture and are not widely employed for the general painting of walls.

Lime-Washing

Limewash has been used for centuries on interior and exterior surfaces, where its slightly coarse texture is of less importance than cost. In its simplest form it consists of quicklime, or hydrated lime, diluted to a brushing consistency with water only. When applied to a surface it undergoes certain chemical changes which harden and fix the material within a few weeks, thus imparting weather-resisting properties.

When required for outdoor use there are several ingredients any of which may be added to improve the washable nature of the coating. Boiled linseed oil, soft soap, melted tallow, and milk, have all been employed with considerable success; the lime thus treated reacts with the oil and forms an emulsion not unlike that employed in washable distemper. Portland cement can be treated in like manner to form a cement water paint or wash.

Limewash is frequently tinted with lime-resisting pigment to form a colour wash; this, whether white or coloured, forms a suitable composition for the treatment of cellars, outhouses, and other situations inclined to be damp. If desired, the mixture can be sieved and applied with a double-action garden spray, the result being cleaner than brush-applied material.

Incidentally, limewash is reasonably efficient as a fire-resisting paint.

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